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ABSTRACT

The correlation between specific personality and biographical variables and the grade point average (GPA) of 211 first quarter community college and technical institute students was investigated using the Adult Nowicki Strickland Internal-External scale to determine locus of control, the Post High School Self-Concept of Academic Ability scale, and the Survey of Study Habits and Attitudes scale. Locus of control, self-concept of academic ability, and study habits and attitudes were found to be significantly correlated with GPA, as were age, sex, race, and marital status. Delay avoidance in undertaking academic pursuits made the greatest contribution to the explanation in variance in GPA in the multiple regression equation used, followed by self-concept of academic ability, age, sex, race, locus of control, work methods, study habits, and acceptance of educational goals. Study orientation, teacher acceptance, marital status, and study attitudes did not contribute to the multiple regression equation. In a paradigm of interactive factors believed to facilitate academic achievement, biographical variables accounted for 8% of the variance in GPA and personality variables for another 19%; the remainder was attributed to intelligence and other assumed factors. A literature review is included. (Author/MB)

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PERSONALITY AND BIOGRAPHICAL PREDICTORS OF ACADEMIC ACHIEVEMENT IN COMMUNITY COLLEGES AND TECHNICAL INSTITUTES

Abstract

by

John Michael Griffin

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Abstract

This study sought to demonstrate the correlation between specific personality and biographical variables, and the grade point average (GPA) of first quarter community college and technical institute students. The Adult Nowicki Strickland Internal-External scale was used to determine locus of control. Self-concept of academic ability was determined by use of the Post High School Self-Concept of Academic Ability scale. Study habits and attitudes were assessed by the Survey of Study Habits and Attitudes scale. Simple, and multiple regression analysis using stepwise addition of variables to the regression equation was used to determine the degree of association between the dependent variable (GPA) and the independent or predictor variables. Locus of control, self-concept of academic ability, and study habits and attitudes were found to be significantly ($p \leq .05$) correlated with GPA. Age, sex, race, and marital status were also found to be significantly ($p \leq .05$) correlated with GPA. Delay avoidance in undertaking academic pursuits made the greatest contribution to the explanation of variance in GPA in the multiple regression equation. Self-concept of academic ability made the next greatest contribution, followed by age, sex, race, locus of control, work methods, study habits, and acceptance of educational goals and objectives. Study

orientation, teacher acceptance, martial status, and study attitudes did not contribute to the multiple regression equation.

Academic success was defined as the attainment of a first quarter GPA of at least 2.00. Bar graphs for use in predicting student chances of success were developed for both biographical and personality variables. Additionally, personality profiles of the unsuccessful, moderately successful, and highly successful students were developed.

Biographical and personality variables were combined with intelligence and other assumed factors in a paradigm of interactive factors which are believed to facilitate academic achievement. In the paradigm, biographical variables accounted for 8% of the variance in GPA. The personality variables accounted for another 19% of the variance in GPA. The remainder of variance in GPA was attributed to the influence of intelligence, and other factors. The influence of biographical and personality factors on academic achievement is believed to be particularly important to students with marginal intellectual ability.

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Chapter I

Introduction

The community college movement in America has been described by many authors (Cohen, 1969; Cross, 1971; Gleazer, 1973; Medsker and Tillery, 1971; and Roueche and Pittman, 1972). The history, development, philosophy, practices, problems, and future of this innovation in higher education have been outlined. Arthur M. Cohen summarized the importance and beliefs of the community college concept (p. 53):

> The philosophy that each individual, regardless of economic or social status, should be provided the opportunity to develop to his and society's ultimate benefit, found its way into the mainstream of American thought with the advent of the land-grant college. The community junior college is today in the forefront of the thrust that derives from that era.

In North Carolina there are 57 institutions within the State's Department of Community Colleges, a division of the State Board of Education. Seventeen have community college status, and 40 are technical institutes. Community colleges offer two years of college parallel instruction leading to the associate degree. Some also offer technical programs. The technical institutes offer

many technical curricula leading to the Associate in Applied Science degree. Such curricula require two years of study. Vocational programs of nine to twelve months length which culminate in certificates, or diplomas, are also offered.

These institutions adhere to an open-admissions policy for all students over the age of 18 who have graduated from high school or hold an equivalency certificate. The philosophy of this policy was stated by Dr. Dallas Herring, former Chairman of the North Carolina State Board of Education (Southwestern Technical Institute Catalog, 1976, p. 7):

> The only valid philosophy for North Carolina is the philosophy of total education; a belief in the incomparable worth of all human beings, whose claims upon the State are equal before the law and equal before the bar of public opinion; whose talents (however great or however different from the traditional), the state needs and must develop to the fullest possible degree.
>
> This is why the doors to the institutions in North Carolina's system of community colleges [and technical institutes] must never be closed to anyone of suitable age who can learn what they teach. We must take the people where they are and carry them as far as they can go within the assigned function of the system.

All institutions within the North Carolina community college and technical institute system function according to this credo. Yet despite the egalitarian open-door admissions policy, diverse course offerings, and close proximity of institutions to all of the State's citizens, some fail to obtain full benefit of what is offered. For some, complete realization of the education which these conditions should permit, remains an elusive dream.

Historically, students have been selected for entry into higher education primarily by the evaluation of various cognitive criteria. Generally, the high school grade point average (GPA), and scores on the Scholastic Aptitude Test (SAT), or similar test, have allowed prediction of future academic success. Such prediction has been used to determine who is suitable for pursuance of a higher education. Significant statistical correlation does exist between these variables. This makes the high school GPA and the SAT valid predictors of students' success in the traditional college and university setting.

In recent years, interest has increased in the relationship between personality factors and learning, and the use of these factors in predicting achievement. As Dunn, Dunn, and Price (1977, p. 419) pointed out, "how [why] a student learns is perhaps the most important factor related to academic achievement." Personality is defined as "the sum total of one's behaviors, attitudes, and

aspirations. It includes what is, has been, and will become" (Bernard and Huckins, 1971, p. 385). Affective (feelings and emotions) and cognitive (intelligence, knowledge, and wisdom) factors, attitudes, and habits, can be considered parts of personality.

A student who is academically successful is assumed to have all of the personality attributes necessary for such success. It is further assumed that the factors which facilitated past success, will continue to do so in the future. This is why early GPA, in particular, is used in education as a predictive measure.

A degree of stability and constancy is assumed between students' past, and future, performances in both cognitive and affective domains. This assumption may be unfounded for technical institute and community college students. It may, in fact, be inappropriate to use grades earned in high school, and other cognitive criteria, for prediction of academic achievement in the open-door institution. This is due to several reasons. The average age of students in this type of school is 28 years. This is some ten years older than the average age of freshmen in traditional four-year schools. The maturational effect and changed environment of the technical institute and community college (TI and CC) makes the relationship between early achievement, and future academic success, somewhat tenuous.

Admission into the open-door institution is not denied a student on the basis of early GPA, scores on admissions examinations, or other cognitive criteria. These criteria may be used however, for guiding students into certain curricula. For example, students with poor math backgrounds are often assumed to be unsuitable for science curricula. Experience has shown the author that student personality variables may be more important predictors of achievement in science, and in other courses of study. Excessive emphasis on cognitive criteria may even do a grave disservice to the student.

This study was undertaken to learn why some students do poorly in academic endeavors despite apparently having the intelligence and desire to do well. Their actual enrollment in school, in most cases, reflects awareness of the need, and desire, to become better educated. In many cases, such students do poorly because they feel that circumstances beyond their control, and other external forces, conspire to cause them to be unsuccessful. They apparently do not equate diligence and hard work with academic success. Glasser (1969, p. 5) has written that students must accept responsibility for their actions as they relate to success or failure in academe. Other students do poorly because they lack the motivation, attitudes, and study habits conducive to academic achievement.

Many students who enter the open doors of TIs and CCs do so because they have had to leave other schools because of academic difficulties. For them, these institutions may represent a last resort at self-improvement. Also, many students come because they realize that it is time to learn a skill for earning a living. Other students may enter in order to prepare for a second, or even third, career. The students often come with feelings of helplessness, worthlessness, and alienation. Such factors can impede their ability to cope adequately with the business of learning. Hence, one measure of academic achievement, the GPA, may be low. Mathis (1972) found that in Kentucky, "only 37 per cent of the students enrolled in community colleges successfully completed college with a GPA of at least 2.0".

In some cases, barriers to learning are so pronounced that the student becomes discouraged, makes poor grades, and leaves school. Frequently, the attrition rate is quite high. In some schools, the attrition rate is reported to exceed 50 per cent (Mathis, 1972). The "open-door" of CCs and TIs has even been called the "revolving door", a term which reflects the high turnover and failure rate so prevalent in these institutions. Conable (1976) has written about accountability in education. The American people have become increasingly concerned about the costs, and returns to society, of our system of education. All levels are being held accountable for their actions. This concern includes

the CC and TI. Trachtman (1975, p. 324) stated that "the ability to predict academic performance of...[CC and TI]... students is of high priority if such programs are to provide them more than a brief and bitter academic tenure."

One component of the personality which helps account for a student's ability or inability to succeed is the locus of control. This psychological construct refers to a person's expectations regarding his ability or inability to derive success from the environment (Rotter, 1966). In the academic setting, a student who feels that his academic success depends upon external forces such as fate, luck, or the action of "powerful others", like teachers is said to have an external locus of control. Other students believe that they can be academically successful if they really want to. They apply themselves to the attainment of this goal. These students have an internal locus of control.

The relationship between students' locus of control and academic achievement, shown by GPA, has been studied extensively in young children and to a lesser extent in older students. Few studies have involved technical institute students, although some have been made in college and community college. Several instruments have been devised to determine locus of control. The literature contains many reports of their use.

The self-concept is another personality component which seems to be related to academic achievement. There are

many similar definitions of self-concept. Ausubel and Robinson (1969, p. 405) defined it as "the set of cognitive and affective states which define his attitudes toward himself." Values and feelings about ones' ability are included. In the school, students with a poor self-concept have little faith in his or her ability. They are often afraid to attempt a learning task. If they do, the level of achievement is usually low. A student having a good self-concept is not afraid to try novel tasks and does not fear failure. These students have more self-confidence, and seem to have a need for achievement. Such students usually do well academically.

The psychological constructs locus of control, self-concept, and need for achievement may be considered to be self-motives. They help an individual defend and improve the mental picture he/she holds of himself (Edwards, 1968, p.55). The bulk of literature available indicates that these personality factors influence academic achievement. Other students do poorly academically despite having these beneficial personality attributes. In many cases, such students simply do not have good study habits and attitudes.

Statement of Problem

The objective of this study is to construct a pilot model of student chances of success in technical institutes and community colleges based on certain personality variables.

Sub-Problems

This study is designed to answer the following specific questions:

1) What is the relationship between locus of control and one graduation criterion, the GPA?

2) What is the relationship between self-concept of academic ability and one graduation criterion, the GPA?

3) What is the relationship between study habits and attitudes and one graduation criterion, the GPA?

4) What is the relationship between age and one graduation criterion, the GPA?

5) What is the relationship between sex and one graduation criterion, the GPA?

6) What is the relationship between race and one graduation criterion, the GPA?

7) What is the relationship between marital status and one graduation criterion, the GPA?

8) Are there identifiable patterns of responses on questionnaires designed to measure locus of control, self-concept of academic ability, and study habits and attitudes, which correlate with low GPA?

Hypotheses

The following hypotheses are made:

1) There is no significant correlation between locus of control and one graduation criterion, the GPA.

2) There is no significant correlation between self-concept of academic ability and one graduation criterion, the GPA.

3) There is no significant correlation between study habits and attitudes and one graduation criterion, the GPA.

4) There is no significant correlation between age and one graduation criterion, the GPA.

5) There is no significant correlation between sex and one graduation criterion, the GPA.

6) There is no significant correlation between race and one graduation criterion, the GPA.

7) There is no significant correlation between marital status and one graduation criterion, the GPA.

8) There are no identifiable patterns of responses on questionnaires designed to measure locus of control, self-concept of academic ability, and study habits and attitudes, which correlate with low GPA.

Purpose

The purpose of this study is to determine which of several personality variables influence academic success.

Assumptions

The following assumptions are made in this study:

1) The instruments used in this study are valid and appropriate for use on the population studied.

2) Individuals will report their feelings accurately and honestly on the instruments of affective measure used.

3) A GPA < 2.00 is synonymous with low GPA and poor achievement.

4) A GPA ≥ 2.00 is synonymous with high GPA and high achievement.

5) The criterion of GPA success is a GPA of at least 2.00.

Delimitations

The delimitations of this study are:

1) Students making up the study population were enrolled in curriculum programs at Southwestern Technical Institute (STI), P.O. Box 95, Sylva, N. C. 28779, and Western Piedmont Community College (WPCC), Morganton, N. C. 28655.

2) The ages of students ranged from 17 to 46 years.

3) The study population consisted primarily of students from the lower and middle socioeconomic groups.

Need and Significance

In the open-door institution, the attrition rate is often quite high. Some students do so poorly that they are placed on academic probation frequently, and eventually may be suspended from school. Other students voluntarily withdraw. The student who chooses to quit may do so because he or she feels powerless to do well. Such students may not have learned to associate study and hard work with success

in academic endeavors. They see little relation between their actions in the form of studying and lesson preparation, and reinforcement in the form of obtaining good grades. Many students achieve the minimum graduation criteria: completion of all required courses with a 2.0 GPA. Some students are chronic underachievers in that they rarely earn more than a grade of "C" in any course.

The academic records of chronic underachievers often impair their chances of securing good jobs. Generally a GPA of 3.0 is preferred by employers. In addition, should the student decide later to continue his education, he may find that his TI or CC grades are too low to meet entrance requirements at four-year institutions.

Studies of this kind are not common in post-secondary education. The relationship between locus of control, self-concept, and other personality factors, and academic achievement has been studied for some types of student populations. Such studies have not typically included TI and CC students. The literature does contain validation studies using instruments of affective measure on other types of students. This study is unique in that it will add to the validation data already available, information on a new type population. Past studies have not included in-depth analyses of personality variables as they relate to academic achievement. In this study, analysis of completed locus of control, self-concept,

and Survey of Study Habits and Attitudes questionnaires will allow a better understanding of the thoughts and feelings of the underachieving student. Scores obtained on the instruments of affective measure used here will be combined in a paradigm of the unsuccessful CC and TI student. There is no evidence of such a model in the literature. Such a model might facilitate identification and subsequent assistance to the student. Hopefully, a pattern of academic success would ensue. As the student begins to see the cause and effect relationship between actions and reward, an external to internal locus of control shift might result. The self-concept, and study habits and attitudes should also be improved. An old adage says that "nothing breeds success like success". The attrition rate and incidence of low GPA students should be reduced. The study should be of interest to educators in other CCs and TIs, who may modify it to suit their needs.

Chapter II

Review of Related Literature

Introduction

The literature on academic achievement prediction is vast. Formerly, cognitive criteria such as previous academic achievement, and achievement test scores have been used to predict future school success. However, mounting evidence questions the validity of these traditional measures, particularly for community college students. For example, Lindquist (1975) found that the American College Test (ACT) had "little, if any, practical application in predicting the achievement for students enrolled in community college vocational education programs." Holland (1959) reported that the California Psychological Inventory (CPI) and Scholastic Aptitude Test (SAT) "are [only] useful in predicting college freshman grades for ... high aptitude high school seniors" (p.141). Dalton (1976) even concluded that "the ability to predict college grades from the SAT and HSA (high school achievement) seems to be decreasing"(p.445).

Biographical Valuables

Biographic data such as sex, age, marital status, and socioeconomic status have been studied in relation to their influence on academic achievement. The results of these studies have been mixed. Brown, McGuire, and Holtzman (1955) administered the 159-item Student Biographical Inventory (SBI) to 720 entering freshmen in three colleges. Correlational

analysis was then made of SBI scores and first semester GPA. Validity coefficients were .45 for males and .40 for women. The authors concluded that the instrument measures "attributes significantly related to academic success which are not assessed by a scholastic aptitude test" (p.353). Herridge (1971) found that low achievers (GPA 0.00 to 2.00) tended to be youngest, single, and often black. Ngo (1972) reported that the biographic factors age and marital status were related to achievement. Married students, and older students (30 to 40 and over) obtained higher grades than did single, and younger students. In a study involving the prediction of attrition in a North Carolina community college, Moore (1976) found that marital status, race, high school GPA, and curriculum were predictive at the .05 level of significance. Baron (1968) found that for community college students, the only variables predictive of success were sex and the holding of a part-time job. Female students and/or working students were more likely to be academically successful. Age, curriculum, marital status, and other factors were not predictive. Lindquist (1975) studied the predictive ability of age, sex, and marital status. He concluded that they were not useful predictors of students' achievement in vocational education programs at the community college level.

Personality Variables

The utility of certain personality variables as predictors

of academic achievement has received a great deal of study. Holland (1959, p. 141) found that the personality variables as measured by the CPI were highly correlated with college freshman grades. The influence of psychopathology, and the specific personality variables of time orientation and value orientation on academic achievement were investigated by Sattler and Neuringer (1965). The Minnesota Multiphasic Personality Inventory (MMPI) and Edwards Personal Preference Schedule (EPPS) were the instruments used. Of the variables studied, value orientation was the only correlate of academic achievement. Weiner and Potepan (1970) partially described the personality characteristics of excelling and failing college students. The personality variables test anxiety, achievement orientation, and intellectual achievement responsibility (internal/external locus of control) were correlated with midterm scores. The data showed that these variables were predictive of successful male students, but not for female students. Hall (1972) used the McClelland Thematic Aperception Test of N-Achievement (MTAT) and The Inventory of Self-Appraisal (ISA) to predict academic achievement. The study showed that "N-achievement and one ISA scale distinguished between achieving and non-achieving lower SES (socioeconomic status) Mexican-American community college students" (p.224). The Eysenck personality dimension introversion/extroversion was shown to be a significant predictor of reading achievement in community college students (Antoine, 1972).

Bar-Tal (1975) studied individual differences and made attributional analyses of achievement-related behaviors. He concluded that "performance is affected by cognitive learning skills, but also by the reasons people perceive as causes of their successes and failures. People with high achievement needs perceive their successes as caused by their own ability and effort, and their failures as caused by lack of effort. People with low achievement needs blame their failures on lack of ability and do not take credit for their ability when they experience success." Remko (1976) used the Thurstone Temperament Schedule to predict achievement in first-level business computer programming courses at the community college level. The study showed that both "male and female students are likely to make higher grades when they have lower amounts of the personality trait, impulsiveness." The study also showed that "female students also are likely to obtain higher grades when they have lower amounts of the personality trait, dominance, when they spend fewer hours in job-related activities, and prefer to study in quieter surroundings. Male students also are likely to achieve higher grades when they have lower amounts of the personality trait, vigorousness and sociableness, and when they have higher amounts of emotional stability (stableness). Male students who prefer to study alone or who are older than their classmates are likely to achieve higher grades." Sharp (1976) found that ten of the Minnesota Multiphasic Personality Inventory (MMPI) scales were predictive of college attrition.

The personality variables locus of control, self-concept, and study habits and attitudes have been much studied separately, and in conjunction with biographical data, as academic achievement predictors. The literature contains many reports of these studies. However, literature searches made during the spring, summer and fall of 1977, involving manual, and computer-assisted search techniques (ERIC and DATRIX-II) failed to retrieve any citation combining locus of control, self-concept, and study habits and attitudes in a GPA predictive model.

Locus of Control

The importance of reinforcement in the form of reward or gratification in teaching is a well-known and often used adjunct to learning. However, different learners perceive the source of reinforcement differently. According to Rotter (1966, p. 1) "if the person perceives that the event [reinforcement] is contingent upon his own behavior [actions] or his own relatively permanent characteristics", the person has an internal locus of control. If the person perceives that events (reinforcement) are the result of "luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him," the person has an external locus of control. Rotter designed a general-purpose 29-item questionnaire for determining the locus of control. The internal/external locus of

control construct developed from social learning theory (Rotter, 1954).

The locus of control construct has been reviewed by various workers. The developement of our present understanding of this personality dimension has been traced by Strickland (1973). Thomas (1975) examined the underlying constructs. The validity of the construct has been upheld by the studies of Hersch and Scheibe (1967), Joe (1971), and Lefcourt (1966). Hersch and Scheibe (1967) reported new findings on the test-retest reliabilities of the internal/external (I-E) control construct. It was found to relate consistently to several other personality scales, "with internal scorers describing themselves as more active, striving, achieving, powerful, independent and effective" (p.609). The validity of Rotter's I-E construct was generally upheld by the findings of Joe (1971). The Rotter I-E scale is often used for the determination of the validity of other, subsequently developed, locus of control instruments. However, Joe (1971) concluded that "more rigorous and extensive examination of the relation between the locus of control construct and other variables is needed (p. 635). Lefcourt (1966) reported that "locus of control is found predictive to different social behaviors, learning performances, and to more and less achievement-related activities" (p.206). Gold (1968) studied the relationships between I-E scores and need for

achievement, test anxiety, social desirability, academic aptitude, and academic success of first-year university students. Only social desirability and intelligence correlated significantly with the I-E dimension (p. 983).

Various workers have reported a correlation between academic achievement and locus of control orientation. Crandall, Katkovsky, and Crandall (1965) devised the Intellectual Achievement Responsibility (IAR) Questionnaire for use in academic settings. In most studies, high correlation between IAR scores and academic achievement, as shown by GPA, has been demonstrated. Validity and reliability data are reported for this instrument for use with students through twelfth-grade level.

Another measure of students' locus of control was devised by Nowicki and Strickland (Nowicki and Strickland, 1973 ; Nowicki and Duke, 1974). The Adult Nowicki Strickland-Internal External Scale (ANS-IE)[1] contains 40 items based on questions in the Nowicki-Strickland Internal External Scale for Children (Nowicki and Strickland, 1973). Nowicki and Duke (1974) reported the scale's psychometric qualities, reliability, and validity data. The ANS-IE items are written so that a person having a fifth-grade reading level can take the scale. The instrument has a split-half reliability ranging from .74 to .86, $n = 158$; and test-retest reliability over a six-week period of $r = .83$, $n = 48$. Evidence for

[1] see Appendix A for the ANS-IE

construct validity comes from several sources. These include significant positive correlations between the scale and the Rotter scale (r = .68, df = 47, $p \leq .01$; r = .44, df = 33, $p \leq .05$; r = .48, df = 37, $p \leq .01$). Studies have also shown a significant positive correlation between the ANS-IE and neuroticism, anxiety, and schizophrenia. Schizophrenic, neurotic, and anxiety-ridden persons tend to have an external locus of control. A score of 0 - 5 indicates extreme internality, 9 - 12 an average score, and 25+ extreme externality. Nowicki and Duke (1974) reported significant but opposite correlations of the ANS-IE and achievement (GPA) for males and females. In three separate studies they reported that for females r = .63, df = 38, $p \leq .01$; r = .62, df = 26, $p \leq .05$; r = .39, df = 26, $p \leq .05$; and for males r = .48, df = 36, $p \leq .01$; r = -.42, df = 34, $p \leq .05$; r = -.50, df = 22, $p \leq .01$ (p. 136). Nowicki and Duke (1974) reported a mean ANS-IE score of 9.06 $\pm$ 3.89 (n = 154) for college students and 10.96 $\pm$ 5.61 (n = 33) for community subjects. Nowicki (1977) reported Simmons' (1975) finding that male junior college students scored a mean of 9.38 $\pm$ 4.11, n = 64, and females 9.76 $\pm$ 3.82, n = 64. No correlation has been demonstrated between ANS-IE scores and social desirability or intelligence. In the study made by Moore (1976) in North Carolina in which ANS-IE scores were compared with attrited and non-attrited students, non-persisting students scored a mean of 19.20 (n = 115) and persisting students 17.96 (n = 344).

These data indicated that the ANS-IE is a significant (.05 level) predictor of student attrition. Non-persisting students made a higher score indicating a more external locus of control.

In another study, McGhee and Crandall (1968), using the IAR, found a significant positive correlation between internality and grade performance in high school students. This correlation was particularly evident in male students' acceptance of responsibility for failure.

The relationship between elementary students' locus of control and science achievement has been studied by Brooks and Hounshell (1975). These workers found that children with an internal locus of control tended to score high on the Stanford Science Achievement Test. According to these researchers "a student who has an internal locus of control has no less than a preconscience understanding that events in his immediate environment are not capricious happenings but consequences of actions over which he has influence. This personal belief in cause and effect relationships is prerequisite to comprehending the orderliness of natural phenomenona and attaining scientific literacy" (pp. 180-181).

Baker (1972) and Roueche and Mink (1976) have written of the relationship of locus of control to achievement in community college students. Drummond, Smith, and Pinette (1975, p. 34) found that in individualized instruction in reading in the community college, students with an external

locus had, when compared with internals, achieved more improvement in reading skill when a post-test was administered. This indicates that individualized instruction may be an efficacious mode of instruction for externals. Perhaps the paced nature of instruction ensures enough success (reinforcement) for the students' to understand the cause and effect relationship between studying and academic success. A shift in locus of control orientation may have taken place in such students.

Some reports have questioned the existence of a relationship between locus of control and academic achievement. These include those of Hjelle (1970), Lancaster (1974), and Powell (1971). Powell used the IAR but did not find a significant correlation with academic achievement. However, he concluded that "support was obtained for the hypothesis that a measure of more generalized locus of control attitudes was related to academic achievement" (p.47). Nord, Connelly, and Daignault (1974) compared the academic achievement prediction ability of locus of control instruments to that of aptitude tests. They concluded from their review of the literature that "while the findings [of others] are mixed, existing evidence seems to indicate that locus of control, at least in some circumstances, may be a useful predictor of academic success in college [at least] for males" (p.957). ... "Overall, these results [of their study] added to the growing number of

studies which have found a positive relationship between locus of control and personal achievement" (p.960).

Blum (1973), using the Rotter I-E scale, reported that even when ability was controlled, locus of control and the importance attributed to academic achievement interacted to predict grades. D'Amato (1975), using the Rotter I-E scale, investigated the effect of locus of control on performance of community college students in a general psychology course. He reported no significant correlation between the two variables. Hall (1975, p. 112) also reported that the Rotter I-E scale did not correlate with grade attainment of community college students. Spann (1976), using the ANS-IE, conducted a study of community college developmental studies students to determine how effectively control expectancy predicted academic achievement according to the students' sex and ethnic group. He found that locus of control was a significant predictor of achievement.

Self-Concept of Academic Ability

The literature on self-concept is extensive. Wylie (1961) reviewed the literature on the construct and Purkey (1970) reviewed the literature on the relationship between self-concept and school achievement. The self-concept dimension developed from the work of Carl Rogers (Edwards, 1968, p.278). According to Magoon and Garrison (1976, p.229) the self-concept is the "meanings, attitudes, and feelings which the individual has towards himself."

The relationship between the self-concept and academic achievement has been studied extensively by Brookover, Patterson, and Thomas (1962). Brookover, LePere, Hamachek, Thomas, and Erickson (1966), and Brookover, Erickson, and Joiner (1967). Their investigations were conducted at one midwestern city high school in which one class was followed from their seventh through twelfth grade years. They believed that a specific, rather than general, self-concept instrument was more appropriate for use in the academic environment. Therefore, they developed the eight item Self-Concept of (Academic) Ability (SCA) scale. "Self-concept of academic ability refers to the evaluating definitions an individual holds of his ability to achieve in academic tasks as compared with others in his school class" (Brookover et al., 1967, p. 139). The Post-High School Self-Concept of Academic Ability Scale (PHSSCAA)[2] scale was developed from the Self-Concept of Ability scale, Form A (Brookover, 1977)[3]. It contains items modified to make them more suitable for use on older students. Four additional items were added to Form A to make the PHSSCAA. The scale is scored such that the higher the score on the twelve-item scale, the higher or more positive the self-concept of academic ability. A score above 3.00 is considered an above average self-concept of academic ability, and one below 3.00 is considered indicative of a below average self-concept of academic ability. The

[2] see Appendix B for the PHSSCAA

[3] see Appendix C

validity and reliability of the PHSSCAA is generally accepted since that of the SCA has been shown by a significant correlation between GPA and scores on the SCA. The PHSSCAA has been used in several studies but according to Brookover (1977), the original usage was reported by Sproull (1969) and Wamhoff (1969). Brookover et al. (1967) reported that the correlation between SCA and GPA ranged from .48 to .63 over the six years of study. It fell below .50 only for twelfth-grade males (p. 142). The stability reliability coefficients of the SCA for a twelve -month period are .75 for males and .77 for females (p. 165). The Hoyt method of finding internal consistency gave coefficients of .82 and .84 for the total sample of 513 males and 537 females (p. 166). These workers also reported that IQ and socioeconomic status (SES) were correlated with GPA and self-concept of academic ability. However, even with IQ and SES partialled out, a significant correlation between self-concept of academic ability and GPA remained. "In contrast, however, the correlation between measured intelligence and GPA and that between SES and GPA are both greatly reduced by partialling out the effect of variation in self-concept of ability" (p. 145). The Brookover team concluded that "it seems quite clear from these analyses that self-concept of ability makes a significant contribution to the explanation of school achievement as a means through which the evaluations of others are translated into school achievement behavior" (p. 144). They also

reported that a good or positive "self-concept of ability is only a necessary, but not sufficient condition for achievement" (p. 142).

Other workers have also found a significant relationship between measures of self-concept and school achievement. Jones and Grieneeks (1970, p. 203) reported that the Brookover scale was a more effective and consistent predictor of achievement than the SAT. The relationship between the self-concept and reading instruction methods was discussed by Quandt (1972). Hall (1975) studied the relationship of a number of variables on the academic achievement of community college students. She reported (p. 110) that self-concept of ability was correlated with grades for lower class black students ($r = .42$, $p \leq .05$), and for middle class white students ($r = .32$, $p \leq .05$).

The Tennessee Self-Concept Scale (TSCS) is another instrument which has been used to predict grades. In a report on a study to determine the correlation between TSCS scores and academic achievement, Fitts (1972) stated the hypothesis: "Other things being equal, the more optimal [positive] the self-concept, the more effectively the individual will function." It follows that "persons with negative self-concepts would be expected, then, to show higher dropout and failure rates than those with positive self-concepts." Fitts concluded that "the data tend to show that the self-concept has some slight relationship to academic achievement. The

relationship may be more critical if intellectual resources or educational background are borderline. Otherwise, the self-concept seems to be more closely related to the non-cognitive aspects of behavior within the academic setting such as morale and classroom participation"(p.i). Alford and Glass (1974) conducted a study to determine the relationship between self-concept and science achievement in grades four, seven and twelve. He reported that "significant positive correlations between the scholastic dimension of self-concept and science were found to exist at all three grade levels" (p. 177). They also reported that the predictive potential seems to be greater for older students.

Smith (1972) studied the relationship between self-concept of academic ability, locus of control, and academic achievement of black students in a Northern university. Findings indicated a relationship significant at the .05 level between self-concept of academic ability and locus of control.

Study Habits and Attitudes

The beneficial effects of good study habits and attitudes on academic achievement have long been known. An instrument designed to determine study habits and attitudes was designed by Holtzman and Brown (1953). The Survey of Study Habits and Attitudes (SSHA) is presently available as a 100-item scale in which students are asked to rank themselves according to the frequency of acting a particular way, or feeling a certain way about school. The SSHA is

available as Form H for use in high school, and Form C for use in college or other post-secondary institution. The instrument can be read by students having tenth-grade reading skills (Holtzman, Brown, and Farquhar, 1954, p.731). The SSHA produces a total score, study orientation (SO), and six subscores. These are delay avoidance (DA), work methods (WM), study habits (SH=DA+WM), teacher acceptance (TA), education acceptance (EA), and study attitudes (SA=TA+EA). The study orientation score equals SH + SA. Holtzman and Brown (1953, p. 369) reported the following information for the final form of the original SSHA. "Validity ... was .56 for women and .57 for men. Since the SSHA does not correlate appreciably with the usual scholastic aptitude tests, multiple correlations with grades were computed using both the SSHA and the ACE. In view of the admitted unreliability of one-semester grades, the multiple correlations of .63 for 149 women and .73 for 140 men are highly significant and indicate that the SSHA can contribute appreciably to the prediction of academic success and the guidance of college students. These authors concluded that the SSHA "measures important traits which are relatively untouched by the standard college entrance examination" (p. 730). D'Amato (1975) conducted a study to determine the effect of locus of control on achievement in a modular general psychology course. In his study, the SSHA was also used. It was concluded that "the best predictor of [academic achievement] for the modular program [compared to

the traditional lecture method] was the SSHA/SO score, with $r = .38$.

The relationship between locus of control and study habits and attitudes has been studied by several researchers. Bass, Ollendick, and Vuchinich (1974, p. 906) conducted a study to determine if different study habits between internal and external students could explain the correlation between locus of control and academic achievement. The results of this study "indicate that differential study habits are an important factor in the locus of control-academic achievement relationship....It seems that internally oriented males use... [study] time more efficiently than their externally oriented counterparts which aids earning higher grades. However, IQ, uncontrolled here, may be relevant. It is interesting that, despite no significant correlation with GPA, there seems to be no systematic relationship between the I-E scale and study habits for females. Research on the nature and antecedents of this sex difference is needed." In a similar study, Prociuk and Breen (1974, p. 91) "indicated that internal control was related positively to effective study habits and attitudes and to college academic success, while the opposite was true for powerful others and chance control." Ramanaiah, Ribich, and Schmeck (1975) studied internal-external locus of control of reinforcement as a determinant of study habits and academic attitudes. The authors pointed out that "the fact that internals had better study habits and academic attitudes than

externals strongly supports Rotter's hypothesis that internals show more overt achievement-striving behavior than externals (p. 382). Internal S's were also found to exhibit more behavioral conformity. They concluded that "this conformity behavior of internals in the educational setting seems to indicate a tendency of the internals to adapt behavior patterns that facilitate their personal control over outcomes. This supports the hypothesis that internals certainly do conform when it is to their advantage" (Joe, 1971; Lefcourt, 1966, p. 382).

Chapter III

METHODOLOGY

Introduction

The instruments measuring personality characteristics were administered to a total of 211 students. At Western Piedmont Community College (WPCC) 190 students were tested, and at Southwestern Technical Institute (STI) 21 students. The population was tested in large groups at the beginning of the following academic terms: Fall 1976, Winter 1976, Summer 1977, and Fall 1977. The instruments were administered on a group basis in order to minimize possible variance due to the effects of differing environmental conditions existing on the different testing dates. At WPCC the students were participating in a preregistration testing, placement, and orientation program. The students at STI were tested during the first week of their enrollment. The sample consisted of students either planning to enroll, or already enrolled in one of the following major programs of study: nursing, medical laboratory technology, medical office assistant, dental office assistant, mental health associate, accounting, business administration, the secretarial science curricula, medical secretarial, executive secretarial, and legal secretarial, police science, and environmental science.

College transfer students indicated a number of major fields of study, including pre-liberal arts, sociology, social work, math, forestry, engineering, teaching, and psychology. All curricula were associate degree programs with the exception of the dental office assistant curriculum, which was a diploma program.[4]

Dependent Variable - Computation of Grade Point Average

The dependent variable, grade point average (GPA), was computed for each student by dividing the total number of grade quality points earned by the total number of credit hours attempted during the first quarter of study. Both institutions in the study used a four-point (4) GPA system. In each, a grade of "A" earned four (4) quality points per quarter hour, a grade of "B" three (3) points, and a grade of "C" two (2) points. At WPCC a grade of "D" earned one (1) point. The grade "D" was not awarded at STI. Grades of "I" (Incomplete) and "F" (Failure) at WPCC, and "I" and "R" (Repeat) at STI earned no quality points. A grade of "WP" (Withdrawal-Passing) was not computed in the GPA at each school, while a grade of "WF" (Withdrawal-Failing) was.

Independent Variables - Personality and Biographical Factors

Prior to handing-out the instruments of personality measure, each student was given the "Note to the Student" (see Appendix D). Following the advice of Christner (1976)

[4] Due to an insufficient number of cases in the various programs of study, the SPSS program did not allow inclusion of the students' major in the multiple regression equation.

students were not told that the locus of control construct was being measured by the Adult Nowicki Strickland-Internal External scale (ANS-IE, see Appendices A and E). Additionally, they were not told that the self-concept of academic ability was being measured by the Post High School Self-Concept of Academic Ability scale (PHSSCAA, see Appendix B). It was thought that this specific information was unnecessary and would create biased results. Administration was not timed.

The ANS-IE was scored using information regarding the internality or externality of responses provided by the instrument's authors. External responses on the ANS-IE are indicated by an asterisk on the sample ANS-IE in Appendix A. The student form was not so marked. The ANS-IE score equals the total number of external responses marked by the student. The PHSSCAA scale was scored in the following manner: For each item on the twelve (12) item scale, a choice of "a" = 5 points, "b" = 4 points, "c" = 3 points, "d" = 2 points, and "e" = 1 point. The total test score is the arithmetic average of the item scores. The SSHA was scored using the author/publisher supplied key. The biographic data was furnished by the students except for marital status which was retrieved from school records.

Data Analysis

All data were subjected to simple and multiple linear regression analysis using the Statistical Package for the Social Sciences (SPSS) programs (Nie, Hull, Jenkins, Stein-

brenner, and Bent, 1970). Correlation data between the dependent variable (Y), first term GPA, and 13 independent variables (X_{1-13}) were obtained. The independent variables consisted of the raw scores obtained on the instruments of affective measure (X_{5-13}) and the biographical data (X_{1-4}). To determine which independent variables, or set of variables, were the best predictors of GPA, all data were examined by stepwise multivariant analysis. The following specific variables were examined:

Y = First Term GPA

X_1 = Age

X_2 = Sex

X_3 = Race (white-nonwhite)

X_4 = Marital Status (married-unmarried)

X_5 = ANS-IE Score

X_6 = PHSSCAA Score

X_7 = SSHA Subscore: DA

X_8 = SSHA Subscore: WM

X_9 = SSHA Subscore: SH

X_{10} = SSHA Subscore: TA

X_{11} = SSHA Subscore: EA

X_{12} = SSHA Subscore: SA

X_{13} = SSHA Total Score: SO

The following specific statistical analyses were made:

1.. Partial correlations of dependent and independent variables: r X_{1-13} Y. For variable X_2, males were coded 1.0 in the regression equation and females 0.0. For

variable X_3, caucasians were coded 1.0 and nonwhites 0.0. For variable X_4, married status was coded 1.0 and unmarried status 0.0.

2. Intercorrelations of independent variables r X_{1-13}

3. Multiple correlation of R X_{5-13} Y with the effects of X_{1-4} partialled out.

4. Mean, standard deviation, coefficient of determination, standard error, level of significance for all correlations, and for multiple correlation, beta weights and analysis of variance (F-test).[5]

5. Stepwise multivariant analysis of all variables.

6. Expectancy graphs of scores on instruments of affective measure and biographic factors, and attainment of one graduation criterion, a minimum GPA of 2.00.

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[5] The criterion for rejection of the null hypothesis was a correlation significant at the .05 level or less ($p \leq .05$).

Chapter IV

Findings

Biographical Variables

A total of 211 students made up the population studied (Table 1). The group consisted of 154 female, and 57 male students. The population was predominately Caucasian with 194 white students and 13 nonwhite (Black) students. Four students did not indicate race. There were 52 married and 156 unmarried students. Three did not specify marital status. The mean age of the students was 20.9 years (Table 2).

The influence of biographical variables on GPA is shown in Figures 1-4 and Appendix Table 1. Age was positively and significantly correlated ($r = 0.22$, $p \leq .01$, $n = 195$) with GPA. This indicates that older students tend to make higher grades (Figure 1). When age was subjected to multiple regression analysis, it added 3% ($\Delta R^2 = 0.03$) to the multiple correlation between GPA and predictor variables. At step three, multiple R was 0.40, $n = 194$, with 16% of the variance in GPA being accounted for. The F-ratio was significant at $p \leq .01$ (Table 3 and Appendix Table 4). Figure 1 shows that 24% of those students 21 years of age or under did not achieve the criterion of GPA success, a GPA of at least 2.00. Only 13%

Table 1

Summary of ns for Biographical Data

Variable	n
Age	211
Sex	211
Male	57
Female	154
Race	207
White	194
Nonwhite	13
Marital Status	208
Married	52
Unmarried	156

Table 2

Variable Means and Standards Deviations

Variable	Mean	SD	Cases (n)
GPA	2.47	1.02	211
Age	20.90	5.58	210
Sex	0.27	0.45	211
Race	0.92	0.27	207
Marital Status	0.26	0.45	208
Locus of Control	10.07	8.15	208
Self-Concept	3.44	0.42	201
SSHA-DA	25.86	9.44	203
SSHA-WM	26.62	8.80	203
SSHA-SH	52.58	16.40	203
SSHA-TA	31.25	8.08	203
SSHA-EA	30.97	7.47	203
SSHA-SA	61.99	14.58	203
SSHA-SO	118.81	54.35	203

Figure 1

Relationship Between Age and Attainment of One Graduation Criterion, A Minimum GPA of 2.00. Shaded Areas Represent Percentage Not Attaining This Criterion.

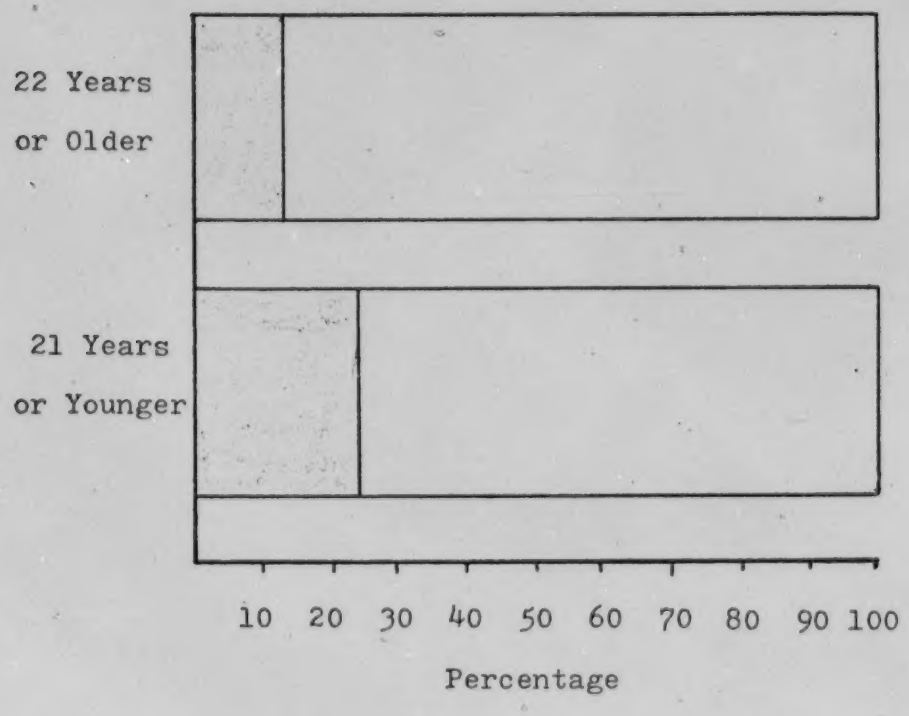


Table 3

Correlational Summary Table for all GPA Predictor Variables

N = 195

Step[a]	Variable	R[b]	R^2	ΔR^2	r[c]	Beta Weight	F
1	SSHA-DA	0.30	0.09	0.09	0.30	0.57791	18.97*
2	PHSSCAA	0.35	0.13	0.04	0.25	0.23711	13.82*
3	Age	0.40	0.16	0.03	0.22	0.23085	12.01*
4	Sex	0.44	0.19	0.03	-0.17	-0.18244	11.22*
5	Race	0.45	0.21	0.02	-0.17	-0.13005	9.83*
6	ANS-IE LOC	0.47	0.22	0.02	-0.15	-0.12848	8.91*
7	SSHA-SO	0.47	0.22	0.00	0.07	-0.04869	7.71*
8	SSHA-WM	0.48	0.23	0.01	0.28	0.62235	6.79*
9	SSHA-SH	0.50	0.25	0.02	0.28	-0.97722	6.99*
10	SSHA-EA	0.51	0.26	0.01	0.26	0.10462	6.31*
11	SSHA-TA	0.51	0.26	0.00	0.19	-0.06807	5.76*
12	Marital Status	0.51	0.26	0.00	0.20	-0.02381	5.26*
13	SSHA-SA	F-Level Insufficient for Further Analysis					

[a] Each step consisted of the indicated variable plus all those that preceeded it.

[b] Coefficient of multiple regression

[c] Coefficient of simple regression

* $p \leq .01$

of the students over the age of 21 failed to attain this average. If the difference in percentages is computed (24% - 13% = 11%: then 11% ÷ 24% = 46%) it may be argued that students over age 21 have 46% less of a failure rate than students under 21 when the two failure rates are compared.

Sex was negatively but significantly correlated (r = -0.17, $p \leq .05$, n = 195) with GPA (Appendix Table 1). This indicated that females tend to make higher grades than males (Figure 2). Sex contributed 3% (ΔR^2 = 0.03) to the correlation between GPA and predictor variables. When it was added to the regression equation at step four, multiple R was 0.44, R^2 = 0.19, and n = 194. The F-ratio was significant at $p \leq .01$ (Table 3 and Appendix Table 5). Figure 2 shows that 29% of the males did not achieve the criterion of GPA success, while 19% of the females did not. If the difference in percentages is computed (29% - 19% = 10%: then 10% ÷ 29% = 35%) it can be shown that females have 35% less of a failure rate than males when the two failure rates are compared.

Race was also negatively but significantly correlated (r = -0.17, $p \leq .05$, n = 195) with GPA (Appendix Table 1). Black students tended to make higher grades (Figure 3). Race added 2% (ΔR^2 = 0.02) to the multiple correlation between predictor variables and GPA. With the addition of this variable to the regression equation at step five, R = 0.45, n = 194, with 21% (R^2 = 0.21) of the variance in GPA being explained. The F-ratio was significant at $p \leq .01$

Figure 2

Relationship Between Sex and Attainment of One Graduation Criterion, A Minimum GPA of 2.00. Shaded Areas Represent Percentage Not Attaining This Criterion.

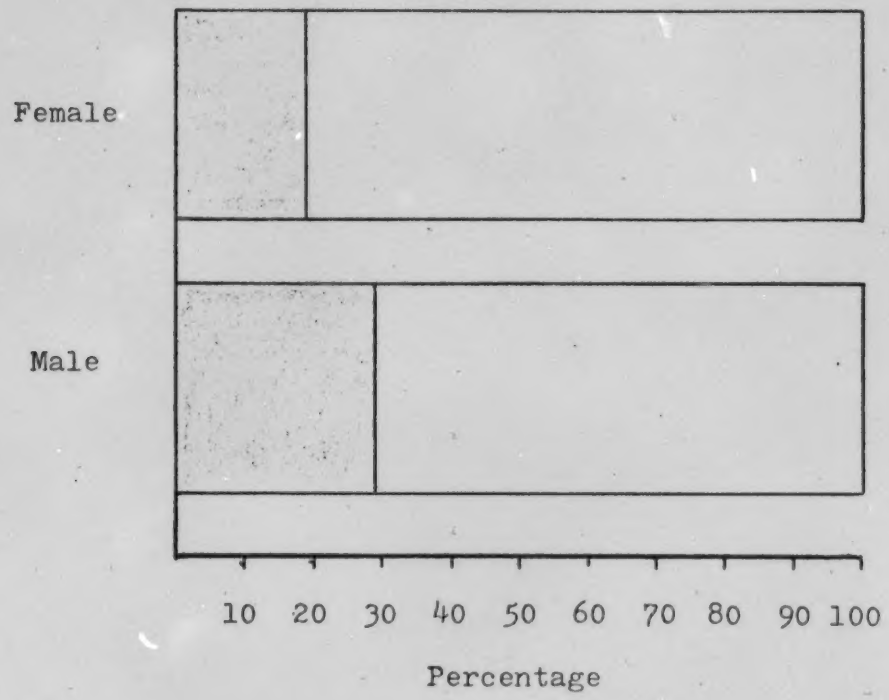
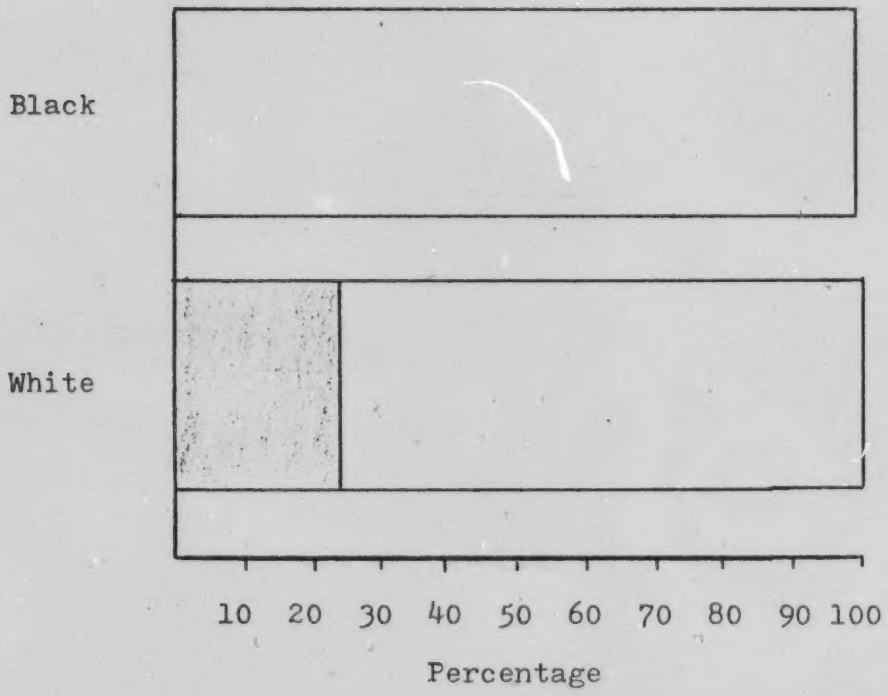


Figure 3

Relationship Between Race and Attainment of One Graduation Criterion, A Minimum GPA of 2.00. Shaded Areas Represent Percentage Not Attaining This Criterion.



(Table 3 and Appendix Table 6). All (100%) of the black students sampled attained the criterion of GPA success, while only 78% of the white students did and 22% did not. If the difference in failure percentages is computed (22% - 0% = 22%: then 22% ÷ 22% = 100%) it may be concluded that black students have 100% less of a failure rate than white students.

A significant positive correlation (r = 0.20, $p \leq .01$, n = 195) was demonstrated between GPA and marital status with married students generally making better grades (Figure 4 and Appendix Table 1). Marital status did not make a significant contribution to the multiple correlation between GPA and predictor variables (Table 3 and Appendix Table 13). Twenty five percent of the unmarried students failed to attain a GPA of at least 2.00 while only 11% of the married students failed to do so. When the difference in percentages is computed (25% - 11% = 14%: then 14% ÷ 25% = 56%) it can be seen that married students have a 56% lower failure rate than unmarried students.

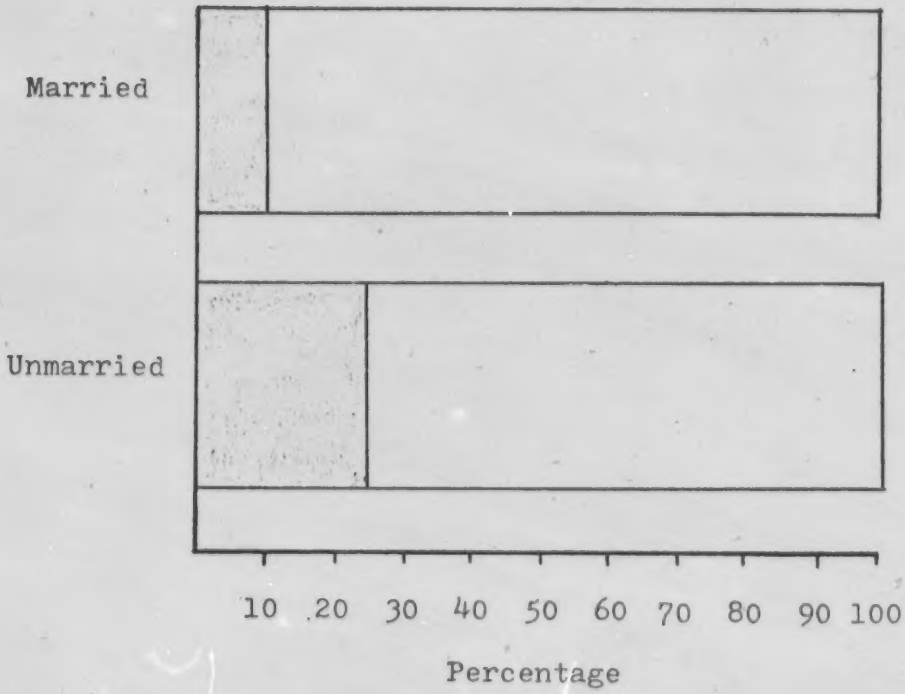
Personality Variables

Locus of Control

A mean Adult Nowicki Strickland-Internal External (ANS-IE) scale locus of control score of 10.07, SD = 8.15, n = 208 was obtained in this study (Table 2). This variable was negatively but significantly correlated with GPA with r = -0.15, $p \leq .05$, n = 195 (Appendix Table 1). This relationship was not weakened when the effects of age (r = -0.15, $p \leq .05$, n = 205)

Figure 4

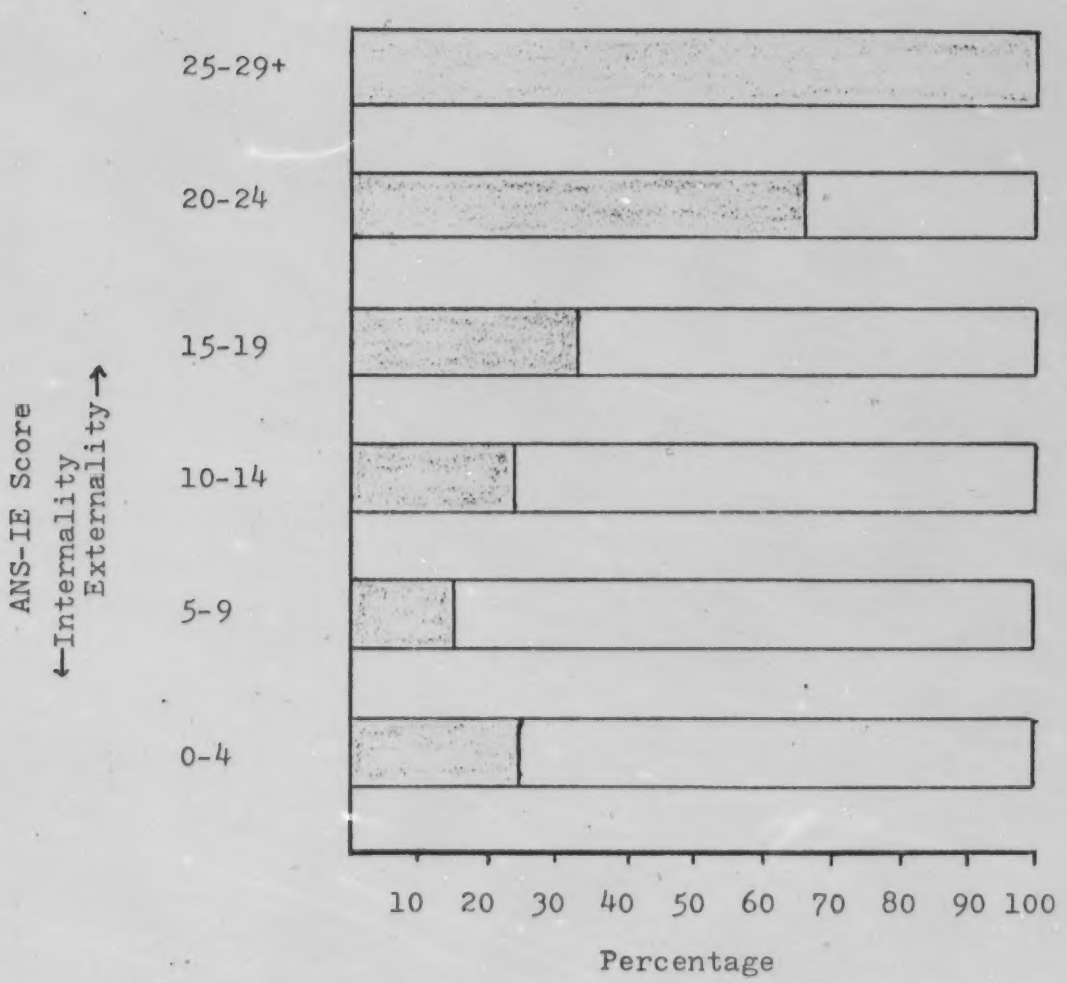
Relationship Between Marital Status and Attainment of One Graduation Criterion, A Minimum GPA of 2.00. Shaded Areas Represent Percentage Not Attaining This Criterion.



and sex (r = -0.16, $p \leq .05$, n = 205) were partialled out (Appendix Tables 14 - 15). However, when the effect of marital status on GPA was controlled, correlation decreased to -0.11, and the level of significance dropped to $p \leq .08$ (Appendix Table 17). When the effect of race was partialled out, r = -0.14, $p \leq .05$, n = 202 (Appendix Table 16). Locus of control was entered into the multiple regression equation at step six (Table 3 and Appendix Table 7). Locus of control contributed significantly ($p \leq .01$) to the multiple correlation between predictor variables and GPA. When entered, R = 0.47, n = 194, 2% (ΔR^2 = 0.02) of the GPA/predictor variables correlation was accounted for. When this correlation was added to the previous correlations, a total of 22% (R^2 = 0.22) of the variance in GPA was explained. Figure 5 shows the relationship between locus of control and achievement of the GPA criterion of success. When students scored 0 - 4 on the ANS-IE, 25% did not achieve the criterion; when 5 - 9, 15%; when 10 - 14, 24%; when 15 - 19, 33%; when 20 - 24, 66%; and when 25 - 29+, none achieved success. If these frequencies are regrouped, then for students scoring 14 or less on the ANS-IE scale, the average rate of nonattainment of the criterion of GPA success is 21%. For those scoring 15 - 29+, the average rate is 66%. If the difference in percentages is computed (66% - 21% = 45%; then 45% ÷ 66% = 68%) it can be shown that students scoring under 15 on the ANS-IE have 68%

Figure 5

Relationship Between Locus of Control, and Attainment of One Graduation Criterion, A Minimum GPA of 2.00. Shaded Areas Represent Percentage Not Attaining Criterion.



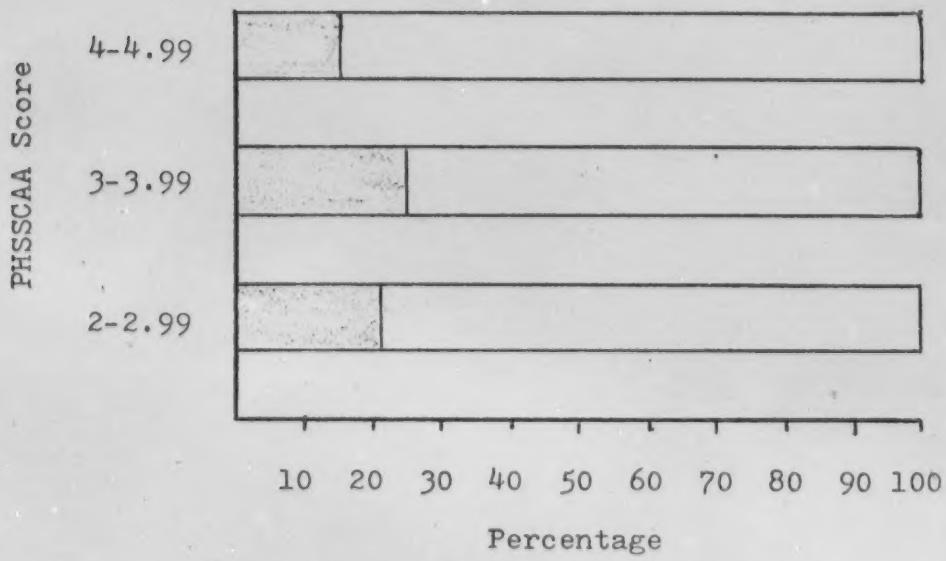
less of a failure rate than students scoring over 14 when the two failure rates are compared. Thus, an internal locus of control orientation favors academic achievement.

Self-Concept of Academic Ability

A mean score of 3.44, SD = 0.42, n = 201 was obtained on the Post High School Self-Concept of Academic Ability (PHSSCAA) scale (Table 2). This variable was positively and significantly correlated (r = 0.25, p ≤ .01, n = 195) with GPA (Figure 6 and Appendix Table 1). The correlation improved slightly when age (r = 0.26, p ≤ .01, n = 198) and sex (r = 0.26, p ≤ .01, n = 198) were controlled. When race (r = 0.21, p ≤ .01, n = 196) and marital status (r = 0.23, p ≤ .01, n = 195) were controlled, the correlation between GPA and self-concept of academic ability decreased slightly (Appendix Tables 14 - 17). This variable was added to the multiple regression equation at step two (Table 3 and Appendix Table 3). It contributed significantly (p ≤ .01) to the multiple correlation between GPA and predictor variables with R = 0.35, n = 194, and 4% (ΔR^2 = 0.04) of the variance in GPA being accounted for. When this correlation was added to the previous correlations, a total of 13% (R^2 = 0.13) of the variance in GPA being accounted for. Figure 6 shows the relationship between self-concept of academic ability and attainment of the criterion of GPA success. When students scored 2 - 2.99 on the PHSSCAA scale, 21% were unsuccessful; 3 - 3.99, 25%; and when 4 - 4.99, 13% were unsuccessful.

Figure 6

Relationship Between Self-Concept of Academic Ability and Attainment of One Graduation Criterion, A Minimum GPA of 2.00. Shaded Areas Represent Percentage Not Attaining Criterion.



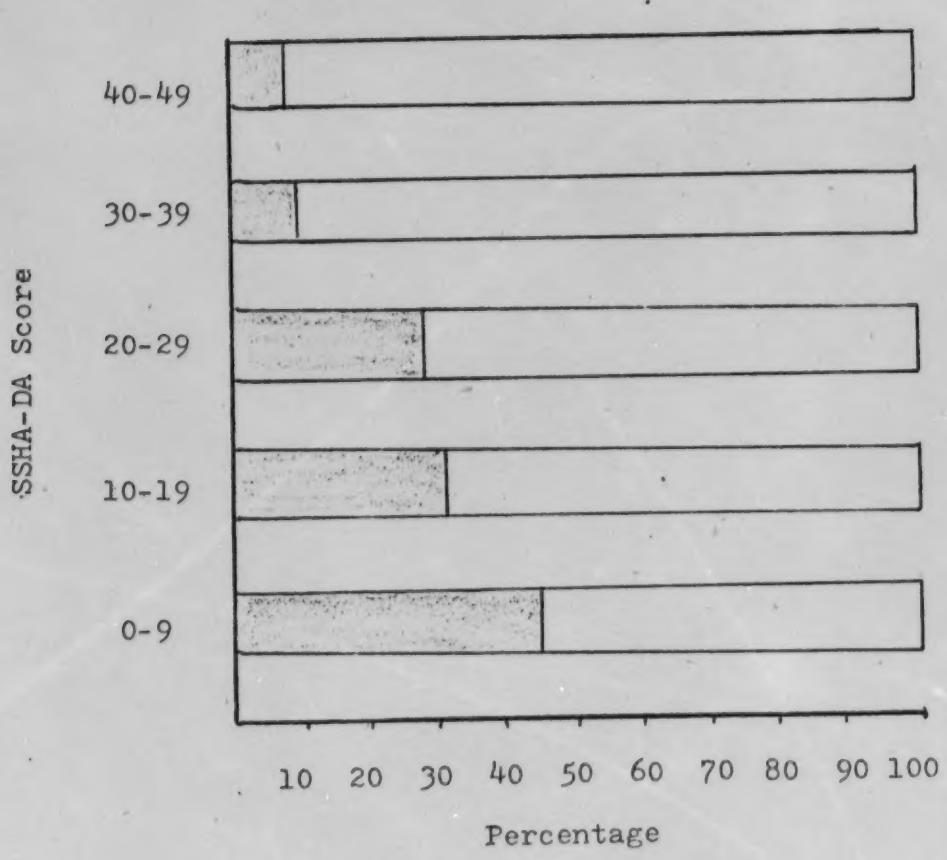
If these figures are regrouped, then for students scoring 3.99 or less on the PHSSCAA scale, the average rate of nonattainment of the criterion of GPA success is 23%. For those scoring 4.00 or higher, only 13% were unsuccessful. When the difference in percentages is computed (23% - 13% = 10%; then 10% ÷ 23% = 44%) it can be seen that students scoring over 4.00 have a 44% lower failure rate than students making less than this score. Thus, a high or positive self-concept of academic ability favors academic success.

Study Habits and Attitudes

The delay avoidance (DA) subscale of the Survey of Study Habits and Attitudes (SSHA) had a mean score of 25.86, SD = 9.43, n = 203 (Table 2). The DA subscale was positively correlated (r = 0.30, $p \leq .01$, n = 195) with GPA (Figure 7 and Appendix Table 1). This correlation was decreased slightly when the effects of age (r = 0.23, $p \leq .01$, n = 199), sex (r = 0.26, $p \leq .01$, n = 200), race (r = 0.23, $p \leq .01$, n = 196) and marital status (r = 0.23, $p \leq .01$, n = 197) were controlled (Appendix Tables 14 - 17). When this score was entered into the multiple regression equation at step one, R = 0.30, $p \leq .01$, n = 194 (Table 3 and Appendix Table 2). It contributed the single greatest proportion (9%) to the explanation of variance in GPA due to predictor variables with R^2 = 0.09. Figure 7 shows the relationship between delay avoidance and attainment of the criterion of GPA success. When students scored 0 - 9 on the SSHA-DA, 44% were unsuccessful; when 10 - 19, 29%;

Figure 7

Relationship Between Delay Avoidance and Attainment of One Graduation Criterion, A Minimum GPA of 2.00. Shaded Areas Represent Percentage Not Attaining Criterion.

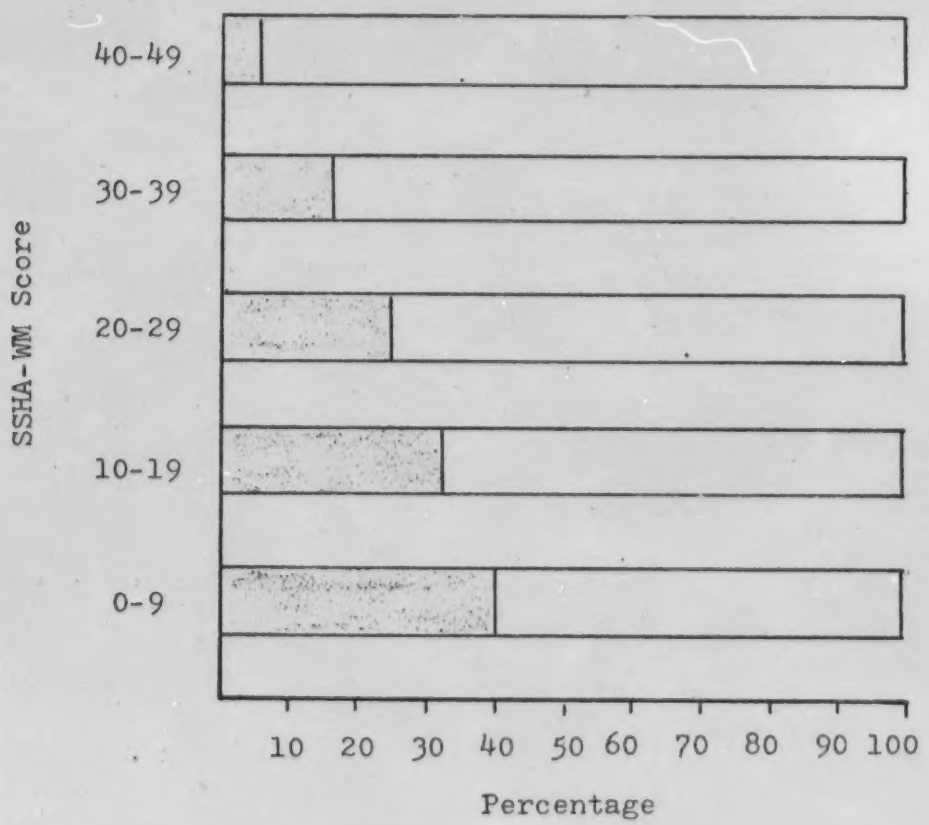


when 20 - 29, 27%; when 30 - 39, 9%; and when 40 - 50, 8% were unsuccessful. If these data are regrouped, then for students scoring 19 or less on the SSHA-DA scale, the average rate of failure to attain the criterion of GPA success was 37%. For those scoring 20 - 49, the average failure rate was 15%. When the difference in percentages is computed (37% - 15% = 22%; then 22% ÷ 37% = 60%) it can be seen that students scoring 20 or greater, on the average, have 60% less of a failure rate than students making less than this score. Thus, ability to avoid delay in pursuing academic matters favors academic achievement.

A mean score of 26.62, SD = 8.80, n = 203 was obtained on the work methods (WM) subscale of the SSHA (Table 2). The SSHA-WM subscale was positively and significantly correlated (r = 0.28, $p \leq .01$, n = 195) with GPA (figure 8 and Appendix Table 1). Appendix Tables 14 - 17 show that this correlation was only slightly decreased by controlling age (r = 0.23, $p \leq .01$, n = 199), sex (r = 0.26, $p \leq .01$, n = 200), race (r = 0.26, $p \leq .01$, n = 196), and marital status (r = 0.22, $p \leq .01$, n = 197). When the SSHA-WM scores were entered into stepwise regression analysis at step 8, a multiple R of 0.48, R^2 = 0.23, $p \leq .01$, n = 194 were obtained (Table 3 and Appendix Table 9). The inclusion of this variable added 1% to the correlation between GPA and predictor variables, making a total of 23% of the variance in GPA accounted for by the predictor variables. Figure 8 shows the relationship between

Figure 8

Relationship Between Work Methods and Attainment of One Graduation Criterion, A Minimum GPA of 2.00. Shaded Areas Represent Percentage Not Attaining Criterion.

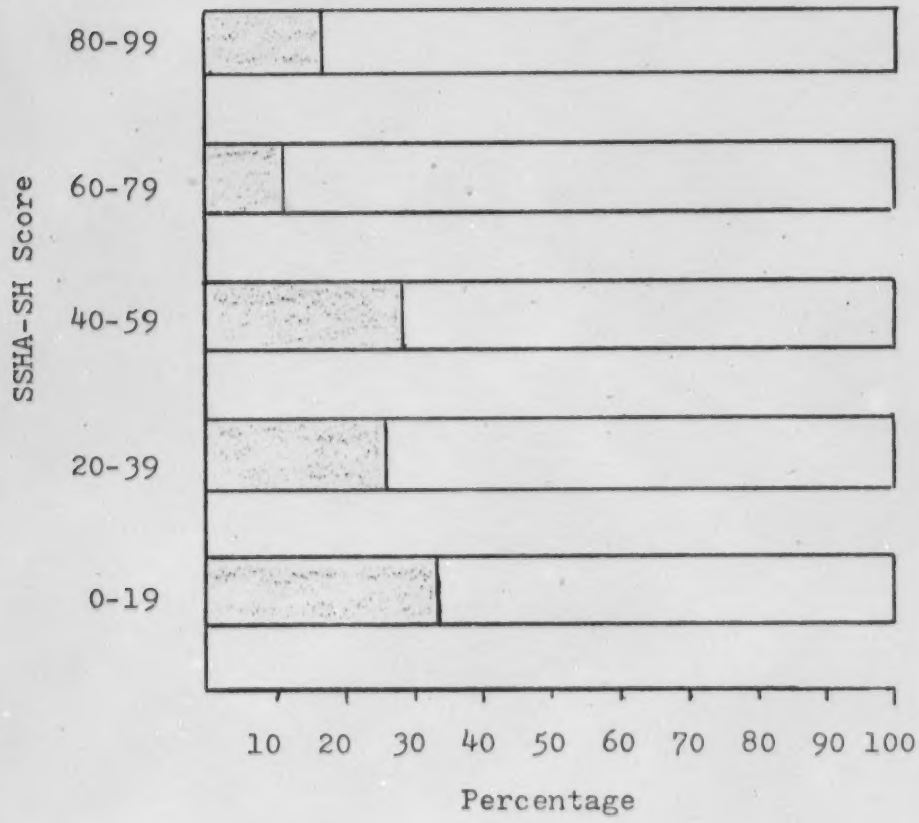


work methods and achievement of the criterion of GPA success. When students scored 0 - 9 on the SSHA-WM, 40% were unsuccessful; when 10 - 19, 32%; when 20 - 29, 24%; when 30 - 39, 16%; and when 40 - 49, 7%. If these findings are regrouped, then for students scoring 19 or less on the SSHA-WM, the average rate of failure was 16%. When the difference in percentages is computed (36% - 16% = 20%; then 20% ÷ 36% = 56%) it can be argued that students scoring 20 or greater have on the average a 56% lower failure rate. Thus, good study habits favor academic achievement.

A mean score of 52.58, $\underline{SD}$ = 16.40, $\underline{n}$ = 203 was obtained on the study habits (SH) subscale of the SSHA (Table 2). Figure 9 and Appendix Table 1 show that SSHA-SH scores were positively and significantly correlated with GPA with $\underline{r}$ = 0.28, $\underline{p} \leq .01$, $\underline{n}$ = 195. Appendix Tables 14 - 17 show that the GPA/SSHA-SH correlation was only slightly weakened by partialling out the effects of age ($\underline{r}$ = 0.22, $\underline{p} \leq .01$, $\underline{n}$ = 199), sex ($\underline{r}$ = 0.26, $\underline{p} \leq .01$, $\underline{n}$ = 200), race ($\underline{r}$ = 0.26, $\underline{p} \leq .01$, $\underline{n}$ = 196), and marital status ($\underline{r}$ = 0.22, $\underline{p} \leq .01$, $\underline{n}$ = 197). When SSHA-SH scores were entered into the stepwise multiple regression equation at step nine, a multiple $\underline{R}$ of 0.50, $\underline{R}^2$ = 0.25, $\Delta \underline{R}^2$ = 0.02, $\underline{n}$ = 194, and $\underline{p} \leq .01$ were obtained (Table 3 and Appendix Table 10). The inclusion of this variable added an additional 2% to the correlation between GPA and predictor variables making a total of 25% of the variance in GPA accounted for by the predictor variables. Figure 9 shows the

Figure 9

Relationship Between Study Habits and Attainment of One Graduation Criterion, A Minimum GPA of 2.00. Shaded Areas Represent Percentage Not Attaining Criterion.



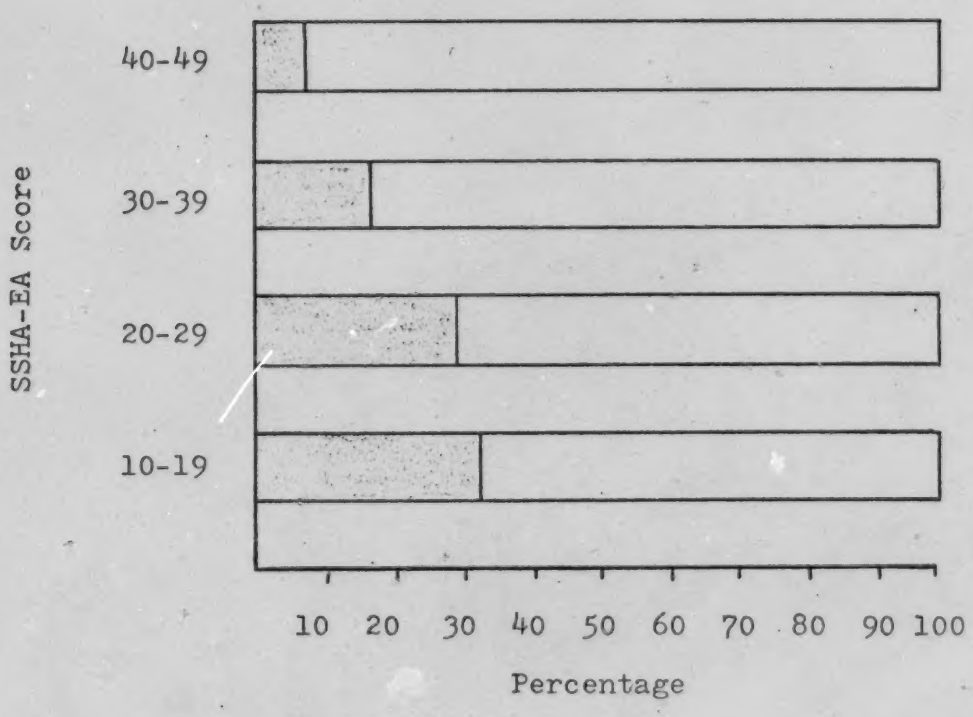
relationship between study habits and attainment of the criterion of GPA success. When students scored 0 - 19 on the SSHA-SH, 33% were unsuccessful; when 20 - 39, 26%; when 40 - 59, 29%; when 60 - 79, 11%; and when 80 - 99, 22% were unsuccessful. If these data are regrouped, for students scoring less than 40 on the SSHA-SH, the average rate of failure to attain the criterion of GPA success was 30%. For those scoring 40 or greater, the average failure rate was 21%. When the difference in percentages is computed (30% - 21% = 9%: then 9% ÷ 30% = 30%) it can be seen that students scoring 40 or higher have a 30% lower failure rate. Thus, good study habits favor academic achievement.

A mean score of 31.25, $\underline{SD}$ = 8.08, $\underline{n}$ = 203 was obtained for the teacher acceptance subscale of the SSHA (Table 2). Appendix Table 3 shows that the SSHA-TA subscale was positively and significantly correlated with GPA with $\underline{r}$ = 0.19, $\underline{p} \leq .01$, $\underline{n}$ = 195. Appendix Tables 14 - 17 show that the correlation was reduced when the effects of age ($\underline{r}$= 0.12, $\underline{p} \leq .10$, $\underline{n}$ = 199), sex ($\underline{r}$ = 0.15, $\underline{p} \leq .05$, $\underline{n}$ = 200), race ($\underline{r}$ = 0.17, $\underline{p} \leq .05$, $\underline{n}$ = 196),and marital status ($\underline{r}$ = 0.12, $\underline{p} \leq .10$, $\underline{n}$ = 197) were controlled. When SSHA-TA scores were entered into the stepwise multiple regression equation at step 11, a multiple $\underline{R}$ of 0.51 was obtained, $\underline{R}^2$ = 0.26, $\Delta \underline{R}^2$= 0.00, $\underline{p} \leq .01$, $\underline{n}$ = 194 (Table 3 and Appendix Table 12). The inclusion of this variable did not add to the multiple $\underline{R}$ equation.

A mean score of 30.97, SD = 7.47, n = 203 was obtained for the education acceptance (EA) subscale of the SSHA (Table 2). Figure 10 and Appendix Table 1 show that the SSHA-EA subscale was positively and significantly correlated with GPA with $r = 0.26$, $p \leq .01$, $n = 195$. Appendix Tables 14 - 17 show that the SSHA-EA/GPA correlation was reduced by controlling biographical variables. For age, $r = 0.18$, $p \leq .01$, $n = 199$; for race $r = 0.24$, $p \leq .01$, $n = 196$; for sex $r = 0.21$, $p \leq .01$, $n = 200$; and for marital status $r = 0.18$, $p \leq .01$, $n = 197$. When SSHA-EA scores were entered into the stepwise multiple regression equation at step ten, multiple $R = 0.51$, $R^2 = 0.26$, $\Delta R^2 = 0.01$, $n = 194$, and $p \leq .01$ (Table 3 and Appendix Table 11). The inclusion of this variable added another 1% to the correlation between GPA and predictor variables, making a total of 26% of the variance in GPA explained by the combined predictor variables. Figure 10 shows the relationship between education acceptance and attainment of the criterion of GPA success. When students scored 10 - 19 on the SSHA-EA, 33% were unsuccessful; when 20 - 29, 30%; when 30 - 39, 16%; and when 40 - 49, 5% were unsuccessful. If these data are regrouped, then students scoring 19 or less on the SSHA-EA scale had a failure rate of 33%, while those scoring above 19 had an average failure rate of 17%. When the difference in percentages is computed (33% - 17% = 16%; then 16% ÷ 33% = 49%) it can be argued that students scoring above 19 have, on the average, a 49% lower

Figure 10

Relationship Between Education Acceptance and Attainment of One Graduation Criterion, A Minimum GPA of 2.00. Shaded Areas Represent Percentage Not Attaining Criterion.



failure rate. Thus, students' acceptance of educational goals favors academic success.

A mean score of 61.99, SD = 14.58, n = 203 was obtained for the study attitudes (SA) subscale of the SSHA (Table 2). Appendix Table 1 shows that the SSHA-SA subscale was positively and significantly correlated with GPA with r = 0.23, p ≤ .01, n = 195. Appendix Tables 14 - 17 show that this relationship was weakened when age (r = 0.15, p ≤ .05, n = 199), sex (r = 0.18, p ≤ .01, n = 200), race (r = 0.21, p ≤ .01, n = 196), and marital status (r = 0.15, p ≤ .05, n = 197) were controlled. When SSHA-SA subscale scores were entered into stepwise multiple regression analysis at step 13, the F-level became too low for further analysis. Thus, this variable did not contribute to the prediction equation.

A mean score of 118.81, SD = 54.35, n = 203 was obtained on the study orientation (SO) subscale of the SSHA (Table 2). Appendix Table 1 shows that the SSHA-SO/GPA correlation was not significant (r = 0.07, n = 195, p ≤ .05). This correlation was generally reduced when biographic factors were partialled out (Appendix Tables 14 - 17). When age (r = 0.04), sex (r = 0.05), and marital status (r = 0.04) were controlled, the correlation decreased somewhat (Tables 14, 15, and 17). Race seemed to exert no effect on the correlation with r = 0.07 (Appendix Table 16). When SSHA-SO scores were entered into the regression equation in step seven, no additional variance in GPA was explained (Table 3). At this step, R = 0.47,

R^2 = 0.22, n = 194, and the F-ratio was significant at $p \leq .01$ (Appendix Table 8).

The general form of a multiple regression equation is $Y = A + B_1X_1 + B_2X_2 + \ldots\ldots B_kX_k$, where A is the Y intercept (predicted GPA), B_i are regression coefficients, and X_1 are values for predictor variables. When variables making a significant contribution to the explanation of GPA were entered into this expression, the following prediction equation was derived: Y = -0.03 + 0.06 (SSHA-DA score) + 0.57 (SCAA score) + 0.04 (Age) + -0.43 (Sex) + -0.49 (Race) + -0.02 (LOC score) + 0.07 (SSHA-WM score) + -0.06 (SSHA-SH score) + 0.01 (SSHA-EA score).

Summary of Findings

1. Locus of control, as measured by the ANS-IE scale was significantly correlated with GPA (r = -0.15, $p \leq .05$, n = 195). Students having an internal locus of control orientation tended to have higher first quarter GPA's than those with an external locus of control. Locus of control contributed 2% (ΔR^2 = 0.02) to the multiple correlation between GPA and predictor variables.

2. Self-concept of academic ability, as measured by the PHSSCAA scale was significantly correlated with GPA (r = 0.25, $p \leq .01$, n = 195). Students with a high (positive) self-concept of academic ability tended to have a higher GPA than those with low (negative) self-concepts of academic ability. Self-concept of academic ability contributed 4% (ΔR^2 = 0.04) to the multiple correlation between GPA and predictor variables.

3. Study habits and attitudes, measured by the SSHA, were generally correlated with GPA. Six subscales were significantly correlated ($p \leq .01$, $n = 195$). These were delay avoidance ($r = 0.30$), work methods ($r = 0.28$), study habits ($r = 0.28$), teacher acceptance ($r = 0.19$), education acceptance ($r = 0.26$), and study attitudes ($r = 0.23$). Students likely to make a low first quarter GPA were those with poor ability to avoid delay in undertaking study/academic activities, have poor work methods and study habits, tend to be unaccepting of teachers and educational objectives, and have poor study attitudes. The delay avoidance ($\Delta R^2 = 0.09$), work methods ($\Delta R^2 = 0.01$), study habits ($\Delta R^2 = 0.02$), and education acceptance ($\Delta R^2 = 0.01$) subscales contributed significantly ($p \leq .01$) to the multiple correlation between GPA and predictor variables. The total or composite score, study orientation, was not significantly correlated with GPA.

4. Sex was significantly correlated with GPA ($r = -0.17$, $p \leq .05$, $n = 195$). Females tended to make higher first quarter GPAs than males. Sex contributed 3% ($\Delta R^2 = 0.03$) to the multiple correlation between predictor variables and GPA.

5. Age was correlated with GPA ($r = 0.22$, $p \leq .01$, $n = 195$). Older students tended to make higher GPAs than younger students. Age contributed 3% ($\Delta R^2 = 0.03$) to the multiple correlation between GPA and predictor variables.

6. Race was correlated with GPA ($r = -0.17$, $p \leq .05$, $n = 195$). Black students tended to attain higher first quarter GPA s than

white students. Race contributed 2% ($\Delta R^2 = 0.02$) to the multiple correlation between GPA and predictor variables.

7. Marital status was correlated with GPA ($r = 0.20$, $p \leq .01$, $n = 195$). Married students tended to make a higher GPA than nonmarried students. However, this variable did not contribute to the multiple correlation between GPA and predictor variables.

8. Students likely to make a low first quarter GPA tended to exhibit the following pattern of personality and biographical characteristics:

1. have an external locus of control;
2. have a low or negative self-concept of academic ability;
3. have poor study habits and attitudes;
4. are male;
5. are young;
6. are single;
7. are white.

Chapter V

Summary, Conclusions, and Recommendations

Summary

The introduction of community colleges and technical institutes to the American educational scene was unquestionably a development of great importance. With their introduction, opportunity to gain a higher education, once open mainly to those of substantial financial means, became available to all. A combination of factors including low cost, convenient location, an open-door admissions policy, and diverse course offerings made these institutions the kind implicit in the philosophy of a democratic nation. Despite these favorable conditions, many students gaining entrance to such institutions find that they are unable to succeed academically. The reasons for this are varied. Furthermore, many studies have shown that some students with adequate intelligence, interest, and aptitude, may be unable to do well due to the influence of unfavorable, or to poorly developed, personality characteristics. Some students do so poorly academically that performance standards require that they be dropped from school rolls. Other students become discouraged and voluntarily withdraw. Many open-door institutions report attrition rates of 50% or more. Other

students are able to complete all required courses in their programs of study, but are only able to maintain a minimum GPA of 2.00.

The purpose of this study was to investigate the influence of the personality variables locus on control, self-concept of academic ability, and study habits and attitudes on first quarter GPA. The relationship to GPA of the biographical variables age, sex, race, and marital status was also examined. Although similar studies have been done in the past, none have sought to combine personality and biographical variables in a GPA predictive model. Such a model would be useful to the counselor and classroom teacher. Students likely to do poorly academically could be identified immediately for subsequent remedial action. These students usually become evident to school personnel as the school term progresses. Often, however, problem students aren't recognized until the chances of helping them have become diminished. This is especially likely to happen as staff reductions, and growing enrollment causes the student/teacher ratio to become less favorable.

This study was conducted during four academic quarters beginning with the Fall of 1976, and extending through the Fall of 1977. The sample consisted of a total of 211 entering students in two Western North Carolina state supported open-door institutions. Most of the students were either enrolled or planned to enroll in two-year programs of study

which culminate in the Associate Degree, while some were in a shorter program. First quarter GPA was compared with biographical data, and scores earned on three instruments of personality measure. Simple, and multiple correlation analysis using stepwise addition of variables to the regression equation were used to determine which variables, and combination of variables yielded optimum prediction of GPA. The following were the main findings:

1. Locus of control was significantly correlated with GPA. Students having an external locus of control tended to have a lower GPA than those with an internal locus of control.
2. Self-concept of academic ability was significantly correlated with GPA. Students having a poor or negative self-concept of academic ability tended to make a lower GPA than those with a good or positive self-concept of academic ability.
3. Study habits and attitudes were generally significantly correlated with GPA. Students likely to make a low GPA have poor ability to avoid delay in undertaking study/academic pursuits, have poor work methods and study habits, tend to be unaccepting of teachers and of educational objectives, and have poor study attitudes.
4. Sex was significantly correlated with GPA. Females were likely to make a higher first quarter GPA than males.

5. Age was significantly correlated with GPA. Older students were likely to make a higher first quarter GPA than younger students.
6. Race was significantly correlated with GPA. Black students were likely to make a higher first quarter GPA than white students.
7. Marital status was significantly correlated with GPA. Married students were likely to make a higher first quarter GPA than unmarried students.
8. A pattern emerged of responses on questionnaires measuring certain personality variables which correlated with low GPA. Students making low GPAs tended to have an external locus of control, negative or poor self-concept of academic ability, and poor study habits and attitudes. In addition, they were likely to be young, male, white and unmarried.

The findings of this study necessitate the rejection of the following hypotheses:

REJECT 1. There is no significant correlation between locus of control and one graduation criterion, the GPA ($p \leq .05$).

REJECT 2. There is no significant correlation between self-concept of academic ability and one graduation criterion, the GPA ($p \leq .01$).

REJECT 3. There is no significant correlation between study habits and attitudes and one graduation criterion, the GPA ($p \leq .01$).

REJECT 4. There is no significant correlation between age and one graduation criterion, the GPA ($p \leq .01$).

REJECT 5. There is no significant correlation between sex and one graduation criterion, the GPA ($p \leq .05$).

REJECT 6. There is no significant correlation between race and one graduation criterion, the GPA ($p \leq .05$).

REJECT 7. There is no significant correlation between marital status and one graduation criterion, the GPA ($p \leq .01$).

REJECT 8. There are no identifiable patterns of responses on questionnaires designed to measure locus of control, self-concept of academic ability, and study habits and attitudes, which correlate with low GPA.

Conclusions

The prediction of academic achievement is of great interest and importance to educators. As the review of the literature has shown, numerous studies have been made of academic achievement as it relates to various independent or predictor variables. These have included biographical, cognitive, and affective or personality factors. These studies have used various statistical procedures in an attempt

to elucidate the nature of the academic achievement/independent variables relationship. Regression analysis is the most often used tool for this purpose. This method seeks to establish the degree to which the variance in one variable, the dependent variable, is attributable to variance in the other, the independent variable (s). Frequently a multiple regression procedure is used as it allows one to analyze the relationship between a dependent variable, and a set of independent or predictor variables. Stepwise multivariant analysis is a modification of this technique. In it, an optimum multiple regression or prediction equation is derived. In the equation, independent variables that do not add substantially to prediction accuracy are deleted. Since the combined "effects" of the independent variables are additive, the coefficient of multiple regression indicates the overall correlation between dependent and independent variables. It can then be used for prediction,and for generalization, about a population.

Garrett (1966) and Thompson (1972) have written about the need for caution in inferring causality from correlation data, and about the practical significance of correlation data. Thompson (1972, p. 55) pointed out that "although the causality issue is important in self-concept research, it is often difficult to resolve." This observation can be extended to include other variables such as biographical factors, locus of control, and study habits and attitudes. As Thompson (1972, p. 55) pointed out, "when correlational findings from

research are reported, much attention is usually devoted to the issue of statistical significance, i.e., the probability that a certain coefficient might occur by chance alone." Garrett (1966, p. 180) pointed out that "causal relations are sometimes revealed or suggested by the technique of partial correlation. Through application of this method, the [possible confounding] influence of a given variable, for example, age, can be controlled and its effect upon variability in other traits held constant."

In the final analysis, the inferral of causality between a dependent variable, and independent variable, or set of variables, rests upon the informed judgement of the investigator. This judgement must include consideration of the following factors: magnitude of coefficient of correlation, size of population, level of significance, and magnitude of the coefficient of determination. Such judgement should allow decisions affecting identification of factors which have a correlation of practical, as well as statistical, significance.

The usefulness of biographical variables as predictors of academic achievement was demonstrated by the findings of this study. Students' age, sex, race, and marital status were found predictive. This finding is generally consistent with the findings of several other studies, although none reported all variables predictive of GPA (Baron, 1968; Herridge, 1971; Moore, 1976; and Ngo, 1972).

Figure 11 shows the relationship of these variables to

Figure 11

Model of Student Chances of Success in Community Colleges and Technical Institutes Based on Biographical Variables.

Chances[a] of Success Decrease	Variable	Chances of Success Increase
	Sex	
Male 7 of 10 are successful		Female 8 of 10 are successful
	Age	
Younger (≤21 years) 8 of 10 are successful		Older (21 years) 9 of 10 are successful
	Race	
White 8 of 10 are successful		Black 10 of 10 are successful
	Marital Status	
Single 8 of 10 are successful		Married 9 of 10 are successful

[a] "Chances" are rounded-off to the nearest "10"

chances of (GPA) success. Older students tended to make higher GPAs than younger students. This may be due to several reasons. These include the greater maturity of the older student which brings with it stability, greater powers of concentration, and greater discipline to study. The mean age (20.9 years) of students in this study is lower than the 24 years of credit students reported by Shearon, Templin, and Daniel (1976, p. 1). The lower mean age found in this study was probably due to the fact that most of the students sampled were enrolling in day programs only. Day students tend to be unemployed and younger. Older students tend to be employed, and attend school at night.

Apparently, female students, and married students, tend to have similar attributes as their grades were also higher than their unmarried, and male, counterparts.

Black students tended to attain higher GPAs than white students. This finding is not consistent with the findings of Herridge (1971). It is certainly contrary to the usual connection seen between racial-cultural/socioeconomic deprivation, and academic achievement. This may be due to several reasons, or combination of reasons. The spuriously high correlation may have been the product of the small number (6%) of black students in the population studied. Overall, in North Carolina's community college system, 24% of the enrollment is nonwhite (1974 - 76 Biennial Report, p.46). The small number of black students was probably due to the

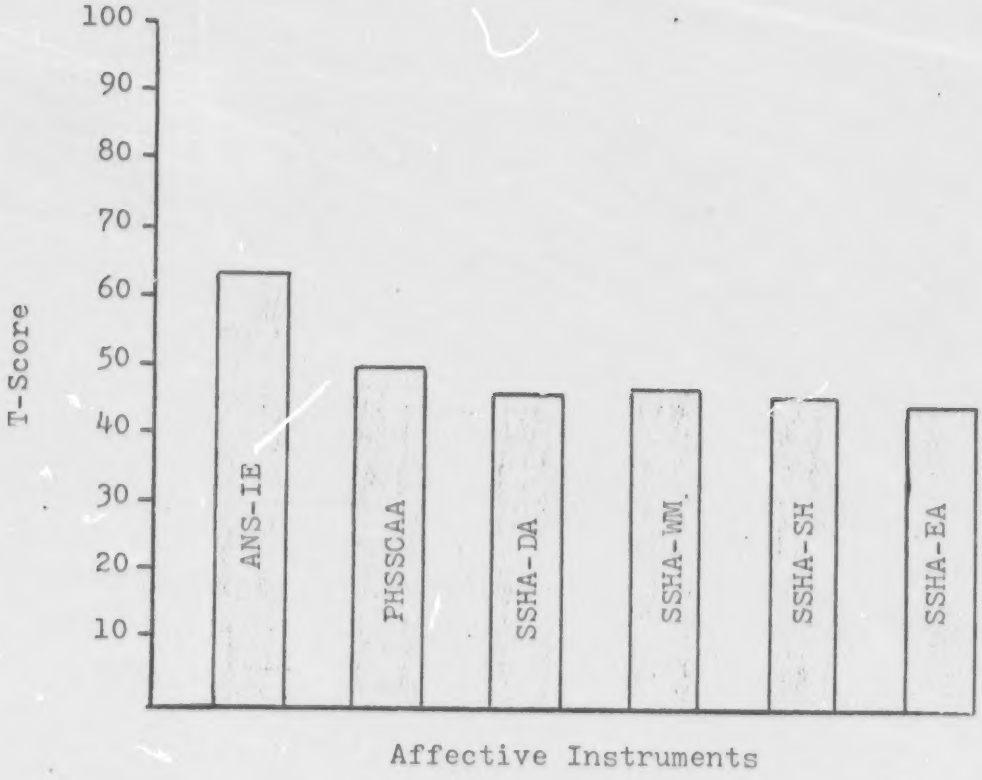
fact that there is a low density of black students in Western North Carolina. All of the black students, as well as most of the white students, participated in a preregistration and testing day, held at Western Piedmont Community College. This participation may indicate an unusually high level of motivation. Highly motivated students would also be likely to have other favorable or well developed personality characteristics, and to subsequently be academically successful. Since the small black portion of the study may not have been representative of the black population in general, the observed correlation may be explained.

The utility of specific personality variables as predictors of academic achievement was also demonstrated by the findings of this study. Locus of control, self-concept of academic ability, and study habits and attitudes were found predictive. This finding is consistent with those of several other studies (Holtzman and Brown, 1953; Moore, 1976; and Nowicki and Duke, 1974). Figures 12 - 14 show the relationship of personality variables to academic achievement. An unsuccessful student is defined as one making a first quarter GPA of under 2.00. A moderately successful student is one attaining a GPA of 2.00 - 2.99, and a successful student is one attaining a GPA of 3.00 or greater. To make comparison of affective scores, and evaluation of students more direct and effective, average raw scores in each success (GPA) bracket have been converted to standard scores (T-Scores).

Figure 12

Personality Profile of the Unsuccessful Student

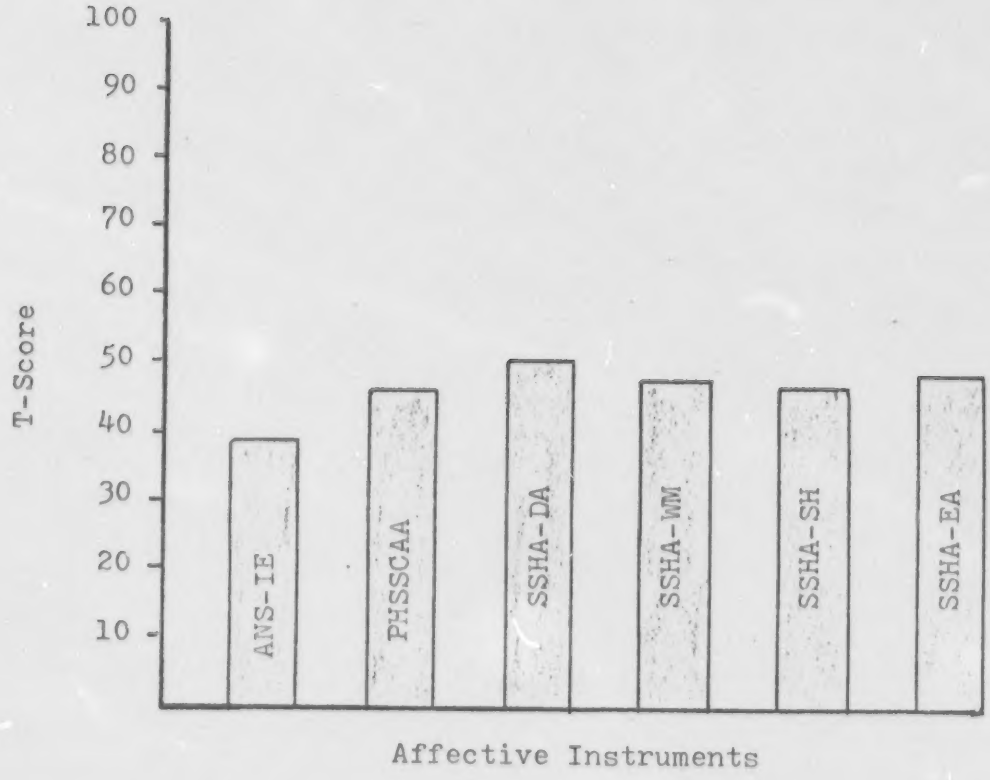
(GPA = 0-1.99)*



*Raw scores converted to standard scores by Z-Score and T-Score Transformations.

Figure 13

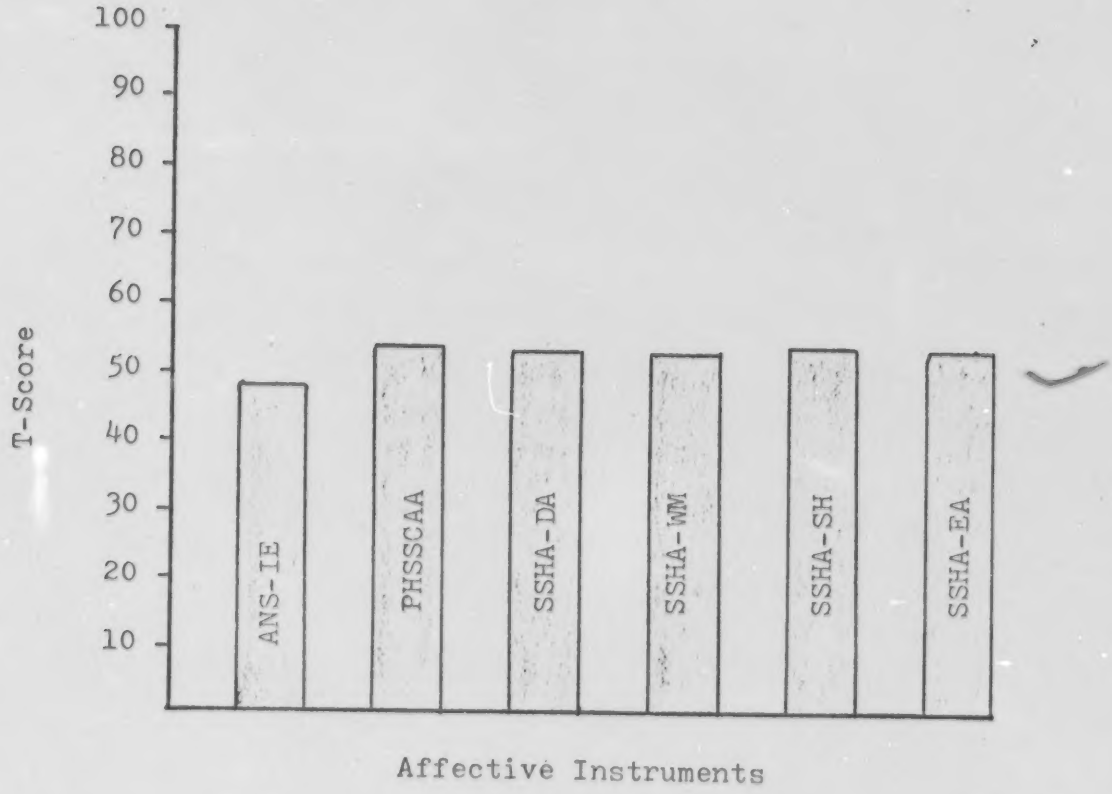
Personality Profile of the Moderately Successful Student (GPA = 2.00 - 2.00)*



*Raw scores converted to standard scores by Z-Score and T-Score Transformation.

Figure 14

Personality Profile of the Highly Successful Student (GPA = 3.00 - 4.00).*



*Raw scores converted to standard scores by Z-Score and T-Score Transformations.

Students having an internal locus of control orientation tended to make higher GPAs than those with an external locus of control. This might be expected in view of our understanding of the locus of control construct. Students having an external locus of control are those who do not feel in control of their academic future. Rather, they believe that external factors such as the action of powerful others, like teachers, fate, and luck, determine the outcome of their educational foray. Seeing little to no connection between their actions in terms of study, it is not surprising that they do not apply themselves to academic tasks. As a result, they do not do well academically. The student may perceive this as proof that he or she is not in control of positive reinforcement in the form of good grades. Reveiving poor grades may serve as a negative reinforcement, thus sustaining the external locus of control orientation.

Moore (1976) found locus of control predictive of attrition. In her study, conducted at Western Piedmont Community College, a mean ANS-IE score of 18.58 was obtained. In this study, a mean ANS-IE locus of control score of 10.07, $\underline{SD}$ = 8.14 was obtained. This score is close to that (9.38 ± 4.11) reported by Simmon (1975) in Nowicki's (1975) paper. The mean score found in this study may be lower than that reported by Moore (1976) because the students in this sample had sufficient interest in their futures to attend a preregistration orientation and testing session. This

was conducted several months before their actual Fall enrollment. Spann (1977, p. 133) reported that ANS-IE scores were predictive of GPA in nine of twelve cases and that they accounted for between 1% and 6.8% of the variance in GPA. He concluded that locus of control was most helpful in predicting the achievement of white, and female, guided studies students.

Students having a good or positive self-concept of academic ability tended to make higher GPAs than those with poor or negative self-concepts of academic ability. Students with positive self-concepts of academic ability generally feel good about themselves, have self-confidence, and thus consider themselves more able to succeed in academe than their peers with negative or poor self-concepts of academic ability. They attempt more academic challenging tasks than those with negative self-concepts of academic ability, and they typically experience more success. Murphy (1974, p. 76) studied the influence of self-concept of academic ability, measured by the PHSSCAA scale, in students in a vocational-technical remedial education program. Students in his sample scored a mean of 39.78 (average = 3.32) on a pretest. After guided studies, they scored a mean of 41.61 (average = 3.47). The mean score of 3.44 obtained in this study is consistent with Murphy's findings.

Students having good study habits and attitudes tended to attain higher GPAs than those with poor study habits and

attitudes. This is not a surprising finding. It is generally consistent with the findings of D'Amato (1975). He found that a significant correlation between GPA and the study orientation score of the SSHA existed. In this study, this score (the total score) was not correlated, but the six subscales were. The Psychological Corporation (1969, p. 12), publishers of the SSHA reported a similar finding in one of five community colleges included in their normative study of the SSHA in those institutions. In school "5", a correlation coefficient of -0.04 for the delay avoidance subscale, and 0.03 for the total or study orientation score were obtained. In this study, the delay avoidance subscale was highly correlated, while the study orientation subscale was not.

This study has demonstrated the correlation between several biographical and personality variables, and academic achievement. These correlations should be useful predictors of achievement. For a study of this kind to be useful to the educator, however, the findings must be applicable to the school setting. Figures 11 - 15 are designed to facilitate application of the findings of this study.

Figure 11 shows student chances of success based on biographical variables. When this information is combined with that of Figures 12 - 14 (personality variables), and the findings summarized in Figures 1 - 10, a teacher or counselor could form an impression of a particular student's chances of success.

Students under the age of 21 are almost twice as likely to be unsuccessful than those over 21. Males are more likely to be unsuccessful than females with females having a failure rate 35% lower than males. Black students were found to be 100% successful, while only 78% of the white students were. Married students have a greater chance of success than non-married ones, and have a failure rate 56% lower than their nonmarried counterparts.

The lower a score on the ANS-IE scale, the greater the chances of success. For example, a student making a raw score of 5 - 9 would have an 85% chance of success, while one scoring 20 - 24 only a 33% chance of success. On the PNSSCAA scale, a student obtaining a score of 2 - 2.99 has a 79% chance of success, while one scoring 4 - 4.99 has an 87% chance of success.

On the SSHA, a student obtaining a SSHA-DA score of 0 - 9 has a 56% chance of success. On the SSHA-DA subscale, a student scoring 30 - 49 has a 90% chance of success. On the SSHA-WM subscale, a student scoring 0 - 9 has a 60% chance of success, while one scoring 40 - 49 has a 93% chance of success. A student scoring 0 - 19 on the SSHA-SH subscale has a 65% chance of success while one scoring 80 - 99 has a 78% chance. On the SSHA-EA, a student scoring 10 - 19 has a 67% chance of success, while one scoring 40 - 49, a 95% chance.

In a particular setting, a teacher or counselor may decide to use one or more of the predictors studied in this investigation. The more used, probably the greater the pre-

dictive accuracy of judgements based on the models developed in this study. Also, of the measures that might be used, a student's chances of success would be related to the number of them that he or she has done well on. Similarly, a students chances of nonsuccess would be related to the number he or she has done poorly on.

An example of using the top (most predictive) biographical and personality variables is presented below. Suppose that in a particular community college or technical institute, study attitudes and habits, locus of control, self-concept of academic ability, sex, age, race, and marital status have been selected for use to help identify new students likely to achieve a first quarter GPA of under 2.00. Hypothetical data is presented for two students, and their chances of success are assessed, based on the findings of this study.

Student A - A 26 (T-Score = 59) year old, married, black female. She scored 8 (T-Score = 47.5) on the ANS-IE, 3.95 (T-Score = 62.1) on the PHS-CAA scale, 36 (T-Score = 61.08) on the SSHA-D subscale, 22 (T-Score = 44.7) on the SSHA-WM subscale, 58 (T-Score = 53.3) on the SSHA-SH subscale, and 40 (T-Score = 62.1) on the SSHA-EA subscale. When these data are compared with the profiles of student success (Figures 11 - 14), it is found that the biographical factors are favorable to academic success, and that the personality variables are character-

istic of the highly successful student. The personality findings indicate that this student has an internal locus of control orientation, good self-concept of academic ability, and generally excellent study habits and attitudes. She has four biographical characteristics favorable to academic achievement. Additionally, she made very favorable scores on five of six personality measures. This student could be expected to have an excellent chance of academic success, probably about 90%.[6]

Student B - A 20 (T-Score = 58.4) year old, unmarried white male. He scored (T-Score = 56.1) on the ANS-IE scale, 3.00 (T-Score = 38.9) on the PHSSCAA scale, 15 (T-Score = 38.5) on the SSHA-DA subscale, 20 (T-Score = 49.3) on the SSHA-WM subscale, 35 (T-Score = 38.3) on the SSHA-SH subscale, and 24 (T-Score = 40.7) on the SSHA-EA subscale. When these data are compared with the profiles of student success (Figures 11 - 14), it is seen that the biographical and personality characteristics (Figure 12) of this student are common to the non-successful student. The personality data indicates that this student has a mildly external locus of control orientation, poor self-concept of academic ability, and poor study habits and attitudes. This student probably has about a 60% chance of success.[7]

[6,7]Percent chances of success is the average of the percent chances of success of the individual predictors used.

Although the purpose of this study was not to investigate intercorrelations among personality and biographical variables, examination of Appendix Table 1 shows some interesting results. These may shed additional light on the nature between these variables and academic achievement. There was a significant negative correlation between locus of control and five of six subscales of the SSHA. This indicated that students with an internal locus of control also had good study habits and attitudes, while those with an external locus of control did not. These correlations agree with the finding that high GPA correlated with an internal locus of control and good study habits and attitudes. Self-concept of academic ability was significantly correlated with three SSHA subscales. This indicated that students with good self-concepts of academic ability were also likely to have good study habits and attitudes. This finding is consistent with the observation that individually, self-concept of academic ability and the three SSHA subscales were individually correlated with GPA. Interestingly, locus of control and self-concept of academic ability were not found to be significantly correlated with each other.

As the review of the literature indicates, there is not universal agreement about the correlation of biographic and personality variables, and GPA. However, the evidence indicating a correlation between these variables predominates. Personality variables are part of the entering behavior a

student brings with him/her to the academic environment (DeCecco and Crawford, 1974, p. 54). They, along with the students' state of cognitive development, and other factors, determine how well they will do in the community college and technical institute. The influence of personality variables on academic achievement may be especially crucial when intelligence is marginal and/or biographic variables are not favorable.

Figure 15 shows the relationship of factors which, it is believed, interact, facilitating academic achievement. In this study, personality variables accounted for a total of 19% of the variance in GPA. Biographical variables together accounted for another 8% of the variance. In a small subsample of the population studied, intelligence accounted for 77% of the variance in GPA (Appendix F).[8] The influence of other factors such as state of health, prior learning, and environmental factors probably also influence GPA.

The high attrition rate, and the prevalence of underachieving students who do complete their programs of study, is clearly a significant problem in community colleges and technical institutes. Public concern for the costs and returns to society in terms of functional and productive citizens, and demand for excellence, require that answers be found to the problem of attrition and underachievement.

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[8]This paradigm is based on previously presented statistical data generated by the study.

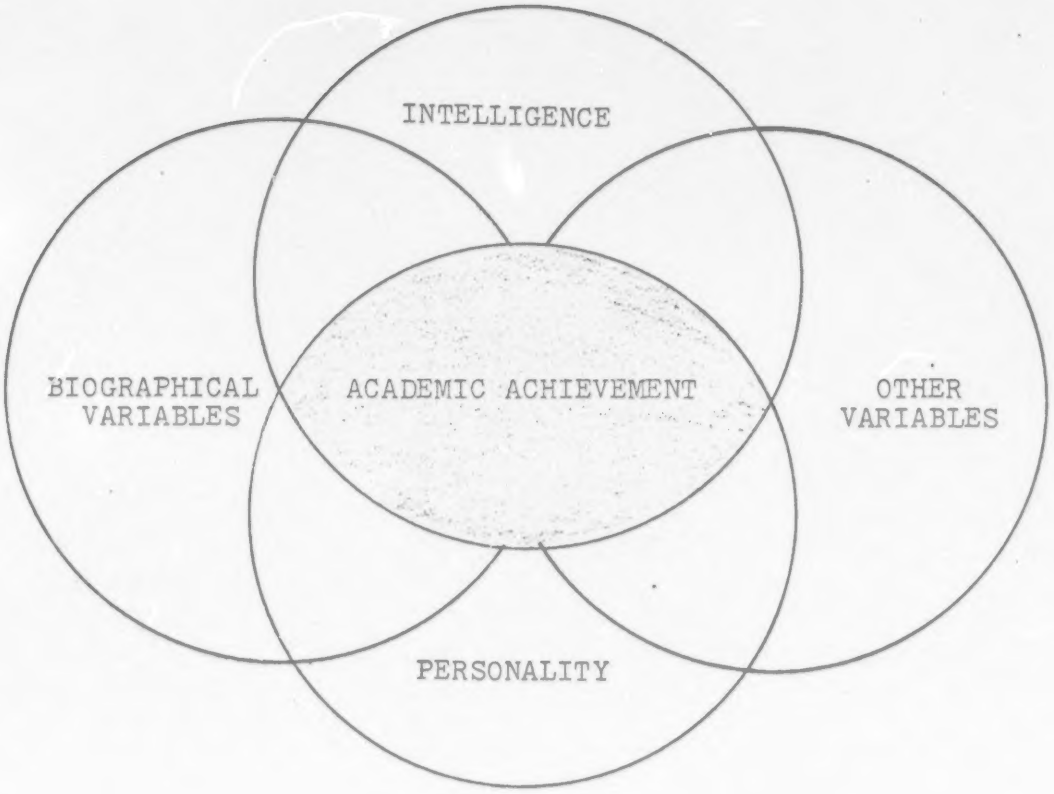

Figure 15. Paradigm of Interactive Factors Facilitating Academic Achievement

The prediction of academic potential has always been of concern to educators. Traditionally, in higher education, tests of cognitive skills have been used to select students suitable for enrollment in colleges and universities. Such tests have included the use of instruments designed to measure aptitude, achievement, and intelligence. It is generally agreed that a significant level of correlation does exist between most of these tests of cognitive skills and academic achievement as indicated by GPA. DeCecco and Crawford (1974, p. 509) cited Vernon's (1958) findings showing the correlation between intelligence and academic achievement. This citation indicates that the intelligence/GPA correlation varies between $\underline{r}$ = 0.80 and $\underline{r}$ = 0.86. Correlations of this magnitude account for 64 to 74 percent of the variance in GPA. The intelligence/achievement relationship was examined in a subsample of the population studied. A correlation coefficient of $\underline{r}$ = 0.88, and $\underline{r}^2$ = 0.77 was obtained (Appendix F). This indicates that a large proportion (77%) of the variance in GPA was due to intelligence. This finding is in close agreement with the previously cited study.

In open-door institutions, the use of tests measuring cognitive skills to determine admissibility of students becomes a moot point. It is mandated by law[9] that all of suitable age be admitted to such schools. However, such

[9] G.S. Ch. 115A. Community Colleges, Etc. 115A-1. Statement of purpose. The General Statutes of North Carolina.

tests may be used for selection of students for various programs of study. It is the belief of this author that this is an unfair practice, particularly in view of the fact that levels of certain cognitive skills, including intelligence, are not constant (Ausubel and Robinson, 1969, p. 226). An additional consideration is that the claims that community colleges and technical institutes serve all people is unfounded. The high attrition rate is evidence of this.

In addition to these considerations, other factors must be taken into account. Student records, likely to contain useful information, are often not readily accessible to the teacher. Many student personnel files are full of pertinent data, which are not fully utilized in the placement and guidance of students. When the data are utilized by the instructional and counseling staff, there may be severe problems in interpretation. This is largely a product of the diverse student clientele served by community colleges and technical institutes. Students of various ages, and from various schools, bring with them records of varying quality and completeness. Some only show grades earned; some include high school graduating rank, achievement, and intelligence test data. Some students are not even high school graduates, but hold high school equivalency certificates. Still other students present military training credentials.

In conclusion, a wealth of data exists which points out the need for alternative means of evaluating the academic promise, and learning problems, of students admitted to open-door institutions. Such evaluation would facilitate the reduction of excessive attrition rates, and occurence of chronic underachievement in these schools. This study has demonstrated a significant relationship between personality and biographical variables, and academic achievement. These include age, sex, race, marital status, locus of control, self-concept of academic ability, and study habits and attitudes. In addition to these variables being correlated with academic achievement, their use would permit identification of specific impediments to learning. A model, designed to be predictive of student chances of success in community colleges and technical institutes was developed.

Recommendations

The findings of this study have demonstrated the academic achievement predictive value of students' biographical and personality characteristics. A model of student chances of success in community colleges and technical institutes was developed. The following specific recommendations are made:

1. The students sampled in this study did not represent a cross section of the student population in North Carolina's community colleges and technical

institutes. This was the case for the biographical factors, age, and race. In view of this, a larger study in the future is suggested which would include a wider segment of the population. Students enrolled in vocational (certificate and diploma), as well as technical programs (degree) should be included.

2. The model of student chances of success developed in this study should be field-tested to determine its actual usefulness in predicting academic achievement. If required, local norms should be developed.
3. If field-testing confirms the usefulness of the predictive model, it should be used in the classroom situation. Appropriate remedial action must be developed and implemented, to reduce attrition, and the incidence of underachievement.

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Appendixes

APPENDIX C

MICHIGAN STATE UNIVERSITY EAST LANSING • MICHIGAN 48823

DEPARTMENT OF URBAN AND METROPOLITAN STUDIES • COLLEGE OF URBAN DEVELOPMENT

July 13, 1977

Professor John M. Griffin
Instructor of Environmental Sciences
Southwestern Technical Institute
P.O. Box 95
Sylva, NC 28779

Dear Professor Griffin:

The post-high school self-concept of academic ability scale, which you mentioned in your recent communication, did indeed develop out of the self-concept of ability scale form A. In fact, it was developed to do some follow-up studies of the same students after they had graduated from high school.

The scale has been used in several studies, but the original useage was by Carroll H. Wamhoff and Kenneth H. Sproull. Their dissertations are available from Michigan State Library and, of course, from the dissertation files at Ann Arbor. The titles are as follows:

Kenneth H. Sproull;
The Relationship Between High School Self-Concept of Academic Ability and Subsequent Acadmeic Achievement at the Community College, 1969
Carroll H. Wamhoff;
Self-Concept of Vocational Ability, Its Relation to Selected Factors in Career Development, 1969

If I can be of any further assistance, please do not hesitate to call me.

Cordially yours,

Wilbur B. Brookover

WBB:cr

APPENDIX D

NOTE TO THE STUDENT

You are about to participate in an opinion and attitude survey that is designed to provide information allowing a better understanding of the thoughts and feelings of the community college and technical institute student. There are three parts to the survey. There are no "right" or "wrong" answers to any of the questions and statements. Please take this survey seriously and answer honestly. Work rapidly but carefully. Do not spend too much time on any one item. Your responses will be kept confidential, so please feel free to answer frankly. Please don't skip any question or statement, nor give more than one answer for each. Read the instructions which go with each part as you get ready to begin it. After reading the instructions, proceed to complete the survey forms. It is important that you fill in your name, age, sex, and other requested information in the spaces provided on <u>each</u> part of the three-part survey.

APPENDIX E

THE UNIVERSITY OF TEXAS AT AUSTIN
COLLEGE OF EDUCATION
AUSTIN, TEXAS 78712

Social Science Research Associate
Community College Education
Education Building—310

Area Code 512 471-7551

December 20, 1976

John M. Griffin
Instructor, Environmental
Science
Southwestern Technical Institute
P. O. Box 95
Sylva, NC 28779

Dear Mr. Griffin:

We told the groups of students who were administered the ANS-IE that this was an opinion survey (which it is) and that there were no right or wrong answers. It was further explained to these students that we were doing research on how community college students feel about various issues. The students were not told this was a locus of control scale as it was felt this was unnecessary, would not be understood by them and would create biased results. This was basically all we told them.

If we can be of further assistance, please contact us again.

Sincerely,

Catherine A. Christner

Catherine A. Christner
Social Science Research
Associate

CAC/lh

APPENDIX F

Statistical Analysis of the Relationship Between Intelligence[a] (IQ) and GPA, $N = 6$

Statistic		General GPA	General IQ
Correlation			
$r = 0.88$ [b]	Mean	2.81	100.33
$r^2 = 0.77$	SD [c]	0.67	18.69
$m = 0.03$	SE_m [d]	0.27	7.63
$b = -0.08$			

[a] High school records did not specify which IQ test was used in every case. Those that did, indicated either the California Test of Mental Maturity or the Otis-Lennon was used.

[b] $p \leq .05$

[c] Standard Deviation

[d] Standard Error of Measurement

Appendix Table 1

Correlational Matrix of All Variables (N = 195).

								SSHA						
	GPA	Age	Sex	Race	MS	LOC	SCAA	DA	WM	SH	TA	EA	SA	SO
GPA	1.00	0.22*	-0.17**	-0.17**	0.20*	-0.15**	0.25*	0.30*	0.28*	0.28*	0.19*	0.26*	0.23*	0.07
Age	0.22	1.00	-0.06	-0.04	0.68	0.04	-0.16	0.31	0.17	0.27	0.29	0.31	0.32	0.14
Sex	-0.17	-0.07	1.00	0.08	-0.03	-0.09	0.19	-0.16	0.03	-0.06	-0.16	-0.17	-0.17	-0.09
Race	-0.17	-0.04	0.08	1.00	-0.09	0.00	-0.06	-0.05	-0.05	-0.05	-0.02	0.01	0.00	0.00
MS	0.20	0.68	-0.03	-0.09	1.00	-0.10	-0.02	0.33	0.27	0.33	0.32	0.35	0.36	0.15
LOC	-0.15	0.04	-0.09	0.00	-0.10	1.00	-0.14	-0.12	-0.19	-0.18	-0.26	-0.24	-0.27	-0.08
SCAA	0.25	-0.16	0.18	-0.06	-0.02	-0.14	1.00	0.20	0.41	0.33	0.09	0.14	0.11	0.08
DA	0.30	0.31	-0.16	-0.05	0.33	-0.12	0.20	1.00	0.64	0.88	0.49	0.69	0.62	0.34
WM	0.28	0.17	0.03	-0.05	0.27	-0.19	0.42	0.63	1.00	0.90	0.54	0.61	0.61	0.29
SH	0.28	0.27	-0.06	-0.05	0.33	-0.18	0.33	0.88	0.90	1.00	0.58	0.73	0.69	0.35
TA	0.19	0.29	-0.16	-0.02	0.32	-0.26	0.09	0.49	0.55	0.58	1.00	0.73	0.92	0.35
EA	0.26	0.31	-0.17	0.01	0.35	-0.24	0.14	0.69	0.61	0.73	0.73	1.00	0.91	0.39
SA	0.23	0.32	-0.17	0.00	0.36	-0.27	0.11	0.62	0.61	0.69	0.92	0.91	1.00	0.40
SO	0.07	0.14	-0.09	0.01	0.15	-0.08	0.08	0.34	0.29	0.35	0.35	0.39	0.40	1.00

* $p \leq .01$

** $p \leq .05$

Appendix Table 2

Multiple Regression Analysis, Step One, for GPA and One Independent Variable

Multiple Regression Analysis		Analysis of Variance	DF	SS	MS	F
R	0.30	Regression =	1	17.861	17.861	18.97*
R^2	0.09	Residual =	193	181.748	0.942	
SE	0.97					

* $p \leq .01$

Appendix Table 3

Multiple Regression Analysis, Step Two, For GPA and Two Independent Variables

Multiple Regression Analysis		Analysis of Variance	DF	SS	MS	F
R	0.35	Regression =	2	25.124	12.562	13.82*
R^2	0.13	Residual =	192	174.485	0.909	
SE	0.95					

* $p \leq .01$

Appendix Table 4

Multiple Regression Analysis, Step Three, For GPA and Three Independent Variables

Multiple Regression Analysis		Analysis of Variance		DF	SS	MS	F
R	0.40	Regression	=	2	31.674	10.558	12.01*
R^2	0.16	Residual	=	192	167.935	0.879	
SE	0.94						

* $p \leq .01$

Appendix Table 5

Multiple Regression Analysis, Step Four, For GPA and Four Independent Variables

Multiple Regression Analysis		Analysis of Variance		DF	SS	MS	F
R	0.44	Regression	=	4	38.137	9.534	11.22*
R^2	0.19	Residual	=	190	161.472	0.850	
SE	0.92						

* $p \leq .01$

Appendix Table 6

Multiple Regression Analysis, Step Five, For GPA and Five Independent Variables

Multiple Regression Analysis		Analysis of Variance				
			DF	SS	MS	F
R	0.45	Regression	= 5		8.238	9.83*
R^2	0.21	Residual	= 189	158.417	0.838	
SE	0.92					

* $p \leq .01$

Appendix Table 7

Multiple Regression Analysis, Step Six, For GPA and Six Independent Variables

Multiple Regression Analysis		Analysis of Variance				
			DF	SS	MS	F
R	0.47	Regression	= 6		7.366	8.91*
R^2	0.22	Residual	= 188	155.412	0.827	
SE	0.91					

* $p \leq .01$

Appendix Table 8

Multiple Regression Analysis, Step Seven, For GPA and Seven Independent Variables

Multiple Regression Analysis		Analysis of Variance	DF	∑S	MS	F
R	0.47	Regression =	7	44.711	6.387	7.71*
R^2	0.22	Residual =	187	154.897	0.828	
SE	0.91					

* $p \leq .01$

Appendix Table 9

Multiple Regression Analysis, Step Eight, For GPA and Eight Independent Variables

Multiple Regression		Analysis of Variance	DF	∑S	MS	F
R	0.48	Regression =	8	45.130	5.641	6.79*
R^2	0.23	Residual =	196	154.480	0.831	
SE	0.91					

* $p \leq .01$

Appendix Table 10

Multiple Regression Analysis, Step Nine, For GPA And Nine Independent Variables

Multiple Regression Analysis		Analysis of Variance	DF	SS	MS	F
R	0.50	Regression =	9	50.640	5.626	6.99*
R^2	0.25	Residual	185	148.970	0.805	
SE	0.90					

* $p \leq .01$

Appendix Table 11

Multiple Regression Analysis, Step 10, For GPA and 10 Independent Variables

Multiple Regression Analysis		Analysis of Variance	DF	SS	MS	F
R	0.51	Regression =	10	50.944	5.094	6.31*
R^2	0.26	Residual =	184	148.665	0.808	
SE	0.90					

* $p \leq .01$

Appendix Table 12

Multiple Regression Analysis, Step 11, For GPA and 11 Independent Variables

Multiple Regression Analysis		Analysis of Variance	DF	SS	MS	F
R	0.51	Regression =	11	51.334	4.67	5.76*
R^2	0.26	Residual =	183	148.275	0.81	
SE	0.90					

* $p \leq .01$

Appendix Table 13

Multiple Regression Analysis, Step 12, For GPA and 12 Independent Variables

Multiple Regression Analysis		Analysis of Variance	DF	SS	MS	F
R	0.51	Regression =	12	51.390	4.282	5.26*
R^2	0.26	Residual =	182	148.219	0.814	
SE	0.90					

* $p \leq .01$

Appendix Table 14

Partial Correlation Coefficients for GPA and Independent Variables, Controlling for Age

Statistic	Variables ANS-IE	LOC	PHSSCAA	SSHA-DA	SSHA-WM	SSHA-SH	SSHA-TA	SSHA-EA	SSHA-SA	SSHA-SO
r	-0.1495		0.2609	0.2276	0.2310	0.2224	0.1161	0.1829	0.1525	0.0378
N	205		198	199	199	199	199	199	199	199
S*	0.032		0.001	0.001	0.001	0.002	0.101	0.009	0.031	0.595

* Significance

Appendix Table 15

Partial Correlation Coefficients for GPA and Independent Variables, Controlling for Sex

Statistic	Variable								
	ANS-IE LOC	PHSSCAA	SSHA-DA	SSHA-WM	SSHA-SH	SSHA-TA	SSHA-EA	SSHA-SA	SSHA-SO
r	-0.1550	0.2561	0.2570	0.2638	0.2583	0.1457	0.2117	0.1845	0.0528
N	205	198	200	200	200	200	200	200	200
S	0.026	0.001	0.001	0.001	0.001	0.038	0.002	0.009	0.455

Appendix Table 16

Partial Correlation Coefficients for GPA and Independent Variables, Controlling for Race

	Variable								
Statistic	ANS-IE LOC	PHSSCAA	SSHA-DA	SSHA-WM	SSHA-SH	SSHA-TA	SSHA-EA	SSHA-SA	SSHA-SO
r	-0.1412	0.2113	0.2734	0.2566	0.2629	0.1692	0.2394	0.2116	0.0696
N	202	196	196	196	196	196	196	196	196
S	0.044	0.003	0.001	0.001	0.001	0.017	0.001	0.003	0.330

Appendix Table 17

Partial Correlation Coefficients for GPA and Independent Variables, Controlling for Marital Status

Statistic	Variable								
	ANS-IE LOC	PHSSCAA	SSHA-DA	SSHA-WM	SSHA-SH	SSHA-TA	SSHA-EA	SSHA-SA	SSHA-SO
r	-0.1121	0.2283	0.2305	0.2193	0.2192	0.1152	0.1813	0.1[illegible]6	0.0389
N	202	195	197	197	197	197	197	197	197
S	0.082	0.001	0.001	0.002	0.002	0.105	0.010	0.034	0.585

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